

Naval Facilities Engineering Command, Southwest
Contracts Department
1220 Pacific Highway, Building 127, Room 112
San Diego, CA 92132-5190

CONTRACT No. N68711-04-D-1104
CTO No. 0004

FINAL
CORRECTIVE ACTION PLAN FOR
UST SITE 14137

June 9, 2006


MARINE CORPS BASE
CAMP PENDLETON, CALIFORNIA

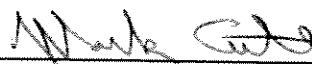
DCN: SES-TECH-06-0060

Prepared by:

SES-TECH

18000 International Boulevard, Suite 1009
Seattle, WA 98188


Sarah L. Denton
Senior Geologist


Mark Cutler, P.G., C.H.
Project Manager

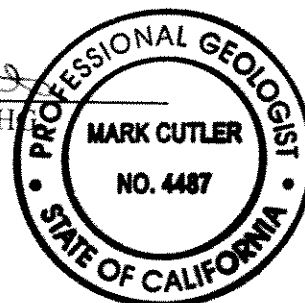


TABLE OF CONTENTS

	<u>PAGE</u>
LIST OF TABLES	iii
LIST OF FIGURES	iii
ABBREVIATIONS AND ACRONYMS	iv
1.0 INTRODUCTION	1-1
1.1 SITE IDENTIFICATION	1-1
1.2 OBJECTIVES	1-1
2.0 SITE DESCRIPTION AND HISTORY	2-1
2.1 SITE DESCRIPTION	2-1
2.2 INITIAL SITE INVESTIGATION	2-1
2.3 UST REMOVAL	2-1
2.4 ADDITIONAL SITE ASSESSMENT	2-2
2.5 GROUNDWATER MONITORING WELL ABANDONMENT	2-4
2.6 SOIL EXCAVATION ACTIVITIES	2-4
2.6.1 Soil Excavation and Confirmation Sampling	2-5
2.6.2 Soil Excavation Backfilling	2-6
2.7 GROUNDWATER MONITORING WELL INSTALLATION	2-6
2.8 POST-EXCAVATION GROUNDWATER SAMPLING	2-7
3.0 ASSESSMENT OF IMPACTS	3-1
3.1 NATURE AND EXTENT OF CONTAMINATION	3-1
3.1.1 Soil	3-1
3.1.2 Groundwater	3-1
3.2 GEOLOGY AND HYDROGEOLOGY	3-2
3.3 EVALUATION OF POTENTIAL IMPACTS	3-2
4.0 ASSESSMENT OF CLEANUP REQUIREMENTS	4-1
4.1 APPLICABLE CLEANUP LEVELS	4-1
4.2 CORRECTIVE ACTION	4-1
5.0 IDENTIFICATION AND EVALUATION OF REMEDIAL ALTERNATIVES	5-1
5.1 REMEDIAL TECHNOLOGY SCREENING	5-1
5.2 REMEDIAL ALTERNATIVES FOR SOIL	5-2
5.2.1 Alternative 1: No Further Action	5-2
5.2.1.1 Effectiveness	5-2
5.2.1.2 Implementability	5-3
5.2.1.3 Cost	5-3
5.2.2 Alternative 2: Excavation with Off-Site Disposal	5-3
5.2.2.1 Effectiveness	5-3

TABLE OF CONTENTS

(Continued)

	<u>PAGE</u>
5.2.2.2 Implementability	5-4
5.2.2.3 Cost.....	5-4
5.3 REMEDIAL ALTERNATIVES FOR GROUNDWATER	5-5
5.3.1 Groundwater Alternative 1: No Further Action.....	5-5
5.3.1.1 Effectiveness	5-5
5.3.1.2 Implementability	5-6
5.3.1.3 Cost.....	5-6
5.3.2 Alternative 2: Remediation by Monitored Natural Attenuation	5-6
5.3.2.1 Effectiveness	5-7
5.3.2.2 Implementability	5-7
5.3.2.3 Cost.....	5-7
6.0 RECOMMENDATIONS	6-1
7.0 REFERENCES.....	7-1

APPENDICES

Appendix A	Well Permit Documentation
Appendix B	Stockpile Waiver Certificate and Soil Excavation Non-hazardous Materials Hauling Manifests
Appendix C	Laboratory Analytical Reports for Excavation Confirmation Soil Samples and Excavation Backfill Material
Appendix D	Excavation Compaction Report
Appendix E	Laboratory Analytical Reports, Field Sampling Logs, and Non-hazardous Material Hauling Manifests for Well Installation and March 2006 Groundwater Sampling Event

LIST OF TABLES

Table 2-1	Initial Site Assessment Soil Sample Results (1991/1992) and UST Removal Soil Sample Results (1996), UST Site 14137, MCB Camp Pendleton, California
Table 2-2	Summary of Historical Groundwater Sampling Results, UST Site 14137, MCB Camp Pendleton, California
Table 2-3	Summary of Historical Soil Sampling Results, UST Site 14137, MCB Camp Pendleton, California
Table 2-4	Summary of Soil Excavation Confirmation Sample Results, UST Site 14137, MCB Camp Pendleton, California
Table 2-5	Summary of Excavation Fill Material Sample Results, UST Site 14137, MCB Camp Pendleton, California
Table 2-6	Summary of Historical Groundwater Elevations, UST Site 14137, MCB Camp Pendleton, California
Table 4-1	Proposed Cleanup Objectives for Diesel Contaminants, UST Site 14137, MCB Camp Pendleton, California
Table 5-1	Summary of Screening of Remedial Technologies for Soil, UST Site 14137, MCB Camp Pendleton, California
Table 5-2	Summary of Screening of Remedial Technologies for Groundwater, UST Site 14137, MCB Camp Pendleton, California

LIST OF FIGURES

Figure 1-1	Site Vicinity Map
Figure 2-1	Site Location Map
Figure 2-2	Historical Soil Sampling Results from Tank Removal (1996) and Initial Site Assessment (Jacobs Engineering Group, 1992)
Figure 2-3	Historical Soil Sampling Results (SOTA Environmental Technology, Inc., 2001)
Figure 2-4	Historical Groundwater Sampling Results (SOTA Environmental Technology, Inc., 2001)
Figure 2-5	Soil Excavation Confirmation Sampling Results
Figure 2-6	Cross Section A-A'
Figure 2-7	Groundwater Gradient and Contaminant Concentration Map

ABBREVIATIONS AND ACRONYMS

µg/L	micrograms per liter
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene and total xylenes
CAP	Corrective Action Plan
cfu	colony forming units
cu yd	cubic yard
DEH	Department of Environmental Health
EPA	U.S. Environmental Protection Agency
g	gram
JEG	Jacobs Engineering Group
MCB	Marine Corps Base
MCL	Maximum Contaminant Level
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MNA	monitored natural attenuation
MPN	most probable number
MTBE	methyl tert-butyl ether
NAVFAC SW	Naval Facilities Engineering Command, Southwest
ND	non-detect
PAH	polynuclear aromatic hydrocarbon
PCE	tetrachloroethene
PRG	Preliminary Remedial Goal
PVC	polyvinyl chloride
RPM	Remedial Project Manager
RWQCB	Regional Water Quality Control Board
SES-TECH	Sealaska Environmental Services, LLC and Tetra Tech EC, Inc.
SOTA	SOTA Environmental Technology, Inc.
SPLP	Synthetic Precipitation Leaching Procedure
TCE	trichloroethene
TPH	total petroleum hydrocarbons
TPH-d	total petroleum hydrocarbons quantified as diesel

ABBREVIATIONS AND ACRONYMS

(Continued)

TPH-g	total petroleum hydrocarbons quantified as gasoline
TRPH	total recoverable petroleum hydrocarbons
TtEC	Tetra Tech EC, Inc.
UST	Underground Storage Tank
VOC	volatile organic compound
Water Board	California Regional Water Quality Control Board
WQO	Water Quality Objective

1.0 INTRODUCTION

This Corrective Action Plan (CAP) for Underground Storage Tank (UST) Site 14137, Marine Corps Base (MCB) Camp Pendleton, California (Figure 1-1), was prepared by SES-TECH, a joint venture between Sealaska Environmental Services, LLC and Tetra Tech FW, Inc.. This CAP summarizes site investigation activities, soil excavation activities, confirmation soil sampling, recent groundwater monitoring well installation, and post-excavation groundwater sampling activities conducted in support of efforts to achieve regulatory site closure. This CAP was prepared under the Naval Facilities Engineering Command, Southwest (NAVFAC SW) Contract No. N68711-04-D-1104, Contract Task Order No. 0004.

1.1 SITE IDENTIFICATION

The following list summarizes site identification data:

Site Address:	Building 14137, 14 Area MCB Camp Pendleton, CA 92055
Facility Name:	Combat Skills Training School
County of San Diego Department of Environmental Health (DEH) Case No.:	H05939-267
Property Owner and Responsible Party:	United States Marine Corps
MCB Camp Pendleton Contact:	Mr. Chet Storrs, Remediation Branch Manager Assistant Chief of Staff, Environmental Security Building 22165 MCB Camp Pendleton, CA 92055-5008 (760) 725-9774
Remedial Project Manager (RPM):	Mr. Bipin Patel NAVFAC SW 1220 Pacific Highway San Diego, CA 92132-5181 (619) 532-4814

1.2 OBJECTIVES

The primary objectives of this CAP include:

- Summarize the site history and assess the impacts of contamination detected in soil and groundwater.
- Identify and evaluate relevant potential corrective action alternatives.

- Provide a recommendation regarding the most appropriate corrective action alternatives for the site.
- Meet the requirements of the California Regional Water Quality Control Board (Water Board; formerly known as the Regional Water Quality Control Board [RWQCB]) and the DEH for the submittal of a CAP.

UST Site 14137 is regulated under the California State Water Resources Control Board Leaking Underground Fuel Tank program as administered by the Water Board, San Diego Region. The document guiding the assessment, remediation, and closure process for the site is the *San Diego County Site Assessment and Mitigation Manual 2004* (San Diego County DEH, 2004).

The overall purpose of this CAP is to identify and evaluate remedial alternatives for effectively and appropriately addressing contamination at UST Site 14137 and to provide a recommendation regarding corrective action at the site. This CAP contains seven sections including this introduction (Section 1.0):

- Section 2.0 - description of the site and a summary of previous site activities
- Section 3.0 - assessment of current soil and groundwater impacts
- Section 4.0 – summary of site cleanup goals
- Section 5.0 - list of alternatives that are appropriate for the site and evaluations on their effectiveness, implementability, and cost
- Section 6.0 - recommendation on the most preferred alternatives
- Section 7.0 – list of references used to prepare this CAP

2.0 SITE DESCRIPTION AND HISTORY

The following sections provide a brief description of the site and a summary of previous activities.

2.1 SITE DESCRIPTION

Building 14137 is located adjacent to the intersection of 18th Street and “G” Street, in the 14 Area of MCB Camp Pendleton and is used as the Combat Skills Training School Facility (Figure 2-1). A 1,000-gallon single-walled, steel-reinforced, concrete UST was installed at the northwest side of Building 14137 in 1943. The UST stored diesel fuel for the facility heating system and was removed in 1996.

2.2 INITIAL SITE INVESTIGATION

After tank integrity testing in 1990 indicated that UST 14137 was leaking, Jacobs Engineering Group (JEG) conducted an initial assessment of the site. On December 31, 1991, and January 30 and 31, 1992, JEG completed a subsurface investigation, including drilling and sampling seven soil borings to total depths ranging from 10 to 25 feet below ground surface (bgs) (Figure 2-2). Because groundwater was encountered during the site investigation, three soil borings (MW14137-1 through 3) were converted to monitoring wells.

During the assessment activities, soil samples were collected and analyzed for total recoverable petroleum hydrocarbons (TRPH) using U.S. Environmental Protection Agency (EPA) Method 418.1. TRPH results ranged from non-detect (ND) to 252 milligrams per kilogram (mg/kg) (Table 2-1 and Figure 2-2).

2.3 UST REMOVAL

On October 18, 1996, the UST and associated product piping (approximately 19 feet) were removed from the site under the supervision of a Hazardous Materials Specialist from the San Diego County DEH. The tank was 7 feet in height (12 inches extended aboveground) and 6 feet in diameter. The tank excavation dimensions were approximately 12 feet by 13 feet and 7.5 feet in depth.

Soil samples collected during the tank removal activities were analyzed for total petroleum hydrocarbons (TPH) quantified as diesel (TPH-d) and TPH quantified as gasoline (TPH-g) using EPA Method 8015 Modified. TPH-d was detected in the two samples collected at 9 feet bgs beneath the tank (14137-A and 14137-B) at concentrations of 7,900 mg/kg and 10,000 mg/kg, respectively (Table 2-1, Figure 2-2). TPH-g was not detected in any of the soil samples, and groundwater was not encountered during the UST removal.

2.4 ADDITIONAL SITE ASSESSMENT

Additional site assessment activities were completed by SOTA Environmental Technology, Inc. (SOTA) during two separate field events in 1998 and 2000. In November 1998, SOTA drilled and sampled six soil borings to depths ranging from 10 to 15 feet bgs (Figure 2-3). Three of the borings (MW14137-4, MW14137-5, and MW14137-6) were subsequently completed as groundwater monitoring wells. All soil samples were analyzed for TPH-d and TPH-g by a mobile laboratory. The sample with the highest TPH-d concentration was additionally analyzed by the mobile laboratory for methyl tert-butyl ether (MTBE) and benzene, toluene, ethylbenzene, and total xylenes (BTEX). Approximately 10 percent of the soil samples were submitted to a stationary laboratory for reanalysis of TPH-d and TPH-g to confirm the mobile laboratory results. The stationary laboratory also performed additional analyses for volatile organic compounds (VOCs), polynuclear aromatic hydrocarbon (PAH), Synthetic Precipitation Leaching Procedure (SPLP)/TPH-d, SPLP/TPH-g, SPLP/VOC, SPLP/PAH, and various physical, biological, and chemical parameter analyses on select soil samples.

Additionally, during laboratory data quality validation of the 1998 data, it was determined that the soil samples that had been analyzed for SPLP in 1998 were analyzed after the method holding time. The purpose of the March 2000 SOTA investigation was to collect new soil samples for the SPLP analysis to ensure the validity of SPLP results. In addition, all samples collected during the March 2000 sampling event were also analyzed by a stationary laboratory for TPH-d, TPH-g, VOCs, and PAHs (Table 2-2). In March 2000, additional soil samples were collected from one additional soil boring (MW14137-4A) placed approximately 3 feet from MW14137-4, which had previously exhibited the highest TPH-d concentrations (the former tank cavity). Samples were collected at 10, 15, and 20 feet bgs from this new boring (Figure 2-3).

The analytical results of the SOTA sampling are described in further detail in the following sections:

Diesel and TRPH in Soil

The location that exhibited the highest TPH-d concentration in the November 1998 sampling event was MW14137-4, located in the former tank cavity (TPH-d was detected up to 730 mg/kg at 15 feet bgs). Laboratory analyses of March 2000 soil samples from MW14137-4A at 10, 15 and 20 feet bgs showed TPH-d concentrations of 5,260 mg/kg; 50 mg/kg; and 26 mg/kg, respectively (Table 2-2).

The locations of soil samples that exhibited TPH-d concentrations at UST Site 14137 are consistent with a diesel release. SOTA estimated the extent of diesel contamination to reach no farther than 10 to 15 feet laterally from the former UST and 15 feet bgs beneath the former UST.

Gasoline, BTEX and MTBE in Soil

All soil samples were analyzed for TPH-g by a mobile laboratory. In addition, three soil samples (from MW14137-4A at 10 feet bgs, 15 feet bgs, and 20 feet bgs) were also analyzed for TPH-g by a stationary laboratory. TPH-g was not detected in soil samples analyzed by the mobile laboratory; however, TPH-g was reported by the stationary laboratory at a concentration of 300 mg/kg in the soil sample from MW14137-4A at 10 feet bgs. However, this TPH-g concentration was not calculated from a typical gasoline pattern and most of the peaks in the chromatogram corresponded to the heavier portion of the chain. Based on this, the detection was determined to be more representative of the TPH-d range.

MTBE was not detected in any soil sample. Insignificant levels of BTEX compounds were detected in some of the soil samples at or below the laboratory practical quantification limits (Table 2-2).

Other Volatile Organic Compounds in Soil

Several VOCs were identified at low concentrations in soil boring MW14137-4 at 5 feet bgs and boring MW14137-4A at 10, 15, and 20 feet bgs. The highest concentration measured was for 1,2,4-trimethylbenzene (260 µg/kg) in boring MW14137-4A at 10 feet bgs. This concentration is significantly less than the residential Preliminary Remediation Goal (PRG) of 5.7 mg/kg.

Polynuclear Aromatic Hydrocarbons in Soil

Several PAHs were identified at relatively low concentrations in soil borings MW14137-4 and MW14137-4A. The highest PAH concentration measured was for phenanthrene (1,240 mg/kg) in boring MW14137-4A at 10 feet bgs. The source of PAHs is presumed to be associated with the diesel release.

Synthetic Precipitation Leaching Procedure in Soil

Due to an oversight, SPLP analysis was performed on the 1998 samples after the hold time had been exceeded. The 1998 SPLP results were, therefore, not used and additional soil samples were collected in March 2000. SPLP analysis was performed on soil samples collected from MW14137-4A because this location had exhibited the highest TPH-d concentrations in soil. The sample at 10 feet bgs contained SPLP/TPH-d at 72 milligrams per liter (mg/L), and the sample at 15 feet bgs contained SPLP/TPH-d at 7.8 mg/L.

Biological Factors in Soil

Selected soil samples were submitted for analyses of heterotrophic microorganisms and hydrocarbon degraders. Plate counts of heterotrophic microorganisms yielded 1,800 colony forming units (cfu) per 10 grams (g). The results indicate that there are naturally occurring microorganisms in site soils capable of degrading hydrocarbons.

Groundwater Sampling Results

During the additional site assessment, groundwater samples were collected from the three monitoring wells installed by SOTA (MW14137-4, MW14137-5, and MW14137-6) (SOTA, 2001). The water sample collected from monitoring well MW14137-4, located adjacent to the former tank cavity, contained TPH-d and TPH-g at concentrations of 10 mg/L and 0.63 mg/L, respectively. However, as with the soil sample previously discussed, TPH-g did not have a typical gasoline pattern and most of the peaks in the chromatogram corresponded to the heavier portion of the chain. Based on this, the detection was determined to be more representative of the TPH-d range. TPH-d was not detected in water samples from monitoring wells MW14137-5 and MW14137-6.

Several VOCs were identified at low concentrations in the water samples collected from each well (MW14137-4, MW14137-5, and MW14137-6), including trace levels of trichloroethene (TCE) and tetrachloroethene (PCE) and low levels of MTBE and BTEX. Benzene was detected at a concentration of 7 µg/L and MTBE was reported at a concentration of 431 µg/L in the water sample collected from MW4 (located adjacent to the tank cavity).

In addition, two PAHs were detected at low concentrations in the water sample from monitoring well MW4. Naphthalene was detected at a concentration of 9 µg/L, and pyrene was detected at a concentration of 0.5 µg/L.

Groundwater monitoring well locations and a summary of these groundwater sample results are shown in Figure 2-4 and Table 2-3.

2.5 GROUNDWATER MONITORING WELL ABANDONMENT

Before soil excavation activities began, existing groundwater monitoring well MW14137-4, located adjacent to the former tank cavity, was abandoned. The well in the area of excavation was abandoned on January 27, 2006, under San Diego County DEH permit number LMON103667. The well was abandoned by over-drilling with an 8-inch diameter auger and backfilled with bentonite grout to the ground surface. A copy of the well abandonment permit and permit closeout documentation is included in Appendix A.

2.6 SOIL EXCAVATION ACTIVITIES

On February 2 and February 3, 2006, TPH-d-impacted soil was excavated from the former tank cavity area. The soil excavation, backfill activities, and the results of confirmation sampling are discussed in the following sections.

2.6.1 Soil Excavation and Confirmation Sampling

The horizontal dimensions of the excavation were 20 feet by 16.5 feet (Figure 2-5) and the excavation extended vertically to 17 feet bgs. A total of approximately 208 cubic yards of soil were excavated.

Soil removed from the excavation was temporarily stockpiled in accordance with RWQCB 95-96 Guidelines (RWQCB, 1995) prior to being transported off site for disposal. A copy of the stockpile waiver certificate is included in Appendix B. The excavated diesel-contaminated soil was transported under a non-hazardous waste manifest to Candelaria Environmental in Anza, California, for disposal (the waste manifests are also included in Appendix B).

A total of eight confirmation soil samples and one duplicate sample were collected from the excavation sidewalls and bottom. The samples were analyzed for TPH-d at a stationary laboratory. Pursuant to the Water Board, the three samples with the highest TPH-d result were also analyzed for SPLP/TPH-d, SPLP/VOCs, and SPLP/PAHs. In addition, one of the samples collected from the west sidewall (0004-075) was also analyzed for total heterotrophic hydrocarbon degraders and diesel-oxidizing degraders. The confirmation soil sample results are summarized on Table 2-4 and are shown on Figure 2-5. The laboratory analytical reports are included in Appendix C.

Soil sample results indicated that no TPH-d contamination remained along the east sidewall and relatively low levels of TPH-d remained along the north sidewall (53 mg/kg) and excavation bottom (14 mg/kg) (Figure 2-5). The samples with the highest TPH-d results were collected from the lower portion of the south sidewall (6,700 mg/kg) and the lower portion of the west sidewall (1,600 mg/kg). Visibly contaminated soil extended from 8 to 15 feet bgs on the western sidewall and from 7 to 15 feet on the southern sidewall.

The excavation could not be extended to the south or to the west because of the presence of Building 14137. A cross section depicting the excavation, site soils, and detected TPH-d concentrations is shown in Figure 2-6.

The three samples with the highest TPH-d results were also analyzed for SPLP/TPH-d, SPLP/VOCs, and SPLP/PAHs (Table 2-4). SPLP/TPH-d was reported in all three samples ranging from 5 mg/L to 34 mg/L. SPLP/VOC results indicated that low levels of leachable ethylbenzene, xylenes, and toluene were present up to 5.3 micrograms per liter ($\mu\text{g/L}$), 7.9 $\mu\text{g/L}$, and 0.65 $\mu\text{g/L}$, respectively. Four leachable PAHs were detected: including acenaphthene (up to 6.3 $\mu\text{g/L}$), fluorene (up to 23 $\mu\text{g/L}$), naphthalene (up to 65 $\mu\text{g/L}$), and phenanthrene (up to 43 $\mu\text{g/L}$). Pyrene was also reported in one of the samples at a trace (estimated) concentration of 2.2 $\mu\text{g/L}$ (Table 2-4).

One sample from the west sidewall was also submitted for analysis of total heterotrophic hydrocarbon degraders and diesel-oxidizing degraders. Results indicated that 2.5E^{+03} total aerobic

heterotrophic bacteria are present and 1.66E^{+03} total diesel oxidizing bacteria are naturally present in site soils (Table 2-4). These bacteria are capable of degrading the hydrocarbon contamination at the site and are present at levels above that considered optimal (1.0E^{+3}) (EPA, 1995).

2.6.2 Soil Excavation Backfilling

Backfilling the excavation was completed on February 3, 2006, with fill material from the MCB Camp Pendleton borrow pit (Three Mile Pit). The backfill material was sampled and analyzed for TPH-d (EPA Method 8015M), pH (EPA Method 9045), Title 22 Metals (EPA Method 6010B), and asbestos (California Air Resources Board Method 435). Analytical results from the backfill material were within acceptance limits specified in the project Work Plan (SES-TECH, 2005) for all parameters except thallium (Table 2-5). Thallium was detected at 7.23 mg/kg, which is slightly above the residential PRG of 5.2 mg/kg (EPA, 2004). Arsenic was also reported in the fill material above its residential PRG; however, the level was below the average background level for arsenic in surface soils at MCB Camp Pendleton (Southwest Division Naval Facilities Engineering Command, 1997). Analytical laboratory reports from the fill material are included in Appendix C. The fill material was placed in 1-foot lifts using a front-end loader, with the goal of a minimal 90 percent compaction. Ninyo and Moore performed compaction tests on each 1-foot lift from 5 feet bgs to surface to ensure that the required compaction level had been achieved. All results were between 92 and 97 percent compaction. The compaction report is included as Appendix D.

2.7 GROUNDWATER MONITORING WELL INSTALLATION

Pursuant to a request from the Water Board, after the excavation, well MW14137-7 was installed along the southwest side of Building 14137, downgradient from the former tank cavity, as shown in Figure 2-7. The permit for both the abandonment and new well installation and the boring/well installation log for the new well are included in Appendix A. The well drilling was performed February 21, 2006, by Test America Drilling using a hollow-stem auger drilling rig. The well was installed to 15 feet bgs and was completed with 4-inch-diameter polyvinyl chloride (PVC) blank casing and 0.010-inch PVC screen. The well screen was installed between 5 and 15 feet bgs.

The new well was developed after construction to clear the screen and filter-pack of fine materials that could possibly clog the screen slots and reduce the effectiveness of the screen. The well was developed by surging and bailing. All soil cuttings were transported under a non-hazardous waste manifest to US Ecology in Beatty, Nevada, for disposal, and all decontamination water and well development water were transported under a non-hazardous waste manifest to K-Pure in Rancho Cucamonga, California, for disposal (the waste manifests are included in Appendix E).

After installation of the new well, a topographic survey was performed to delineate the location and elevation of the well. Measurements were to an accuracy of 0.1 foot horizontally and 0.01 foot vertically, and were in accordance with North American Datum 83 and North American Vertical Datum 88, respectively. The results of the survey are included on the boring log included with the well permit in Appendix A.

2.8 POST-EXCAVATION GROUNDWATER SAMPLING

On March 14, 2006, after the completion of soil excavation activities (Section 2.6) and the installation of new well MW14137-7, a groundwater sampling event was completed.

Groundwater samples were subsequently collected using low-flow sampling methodology and were submitted for laboratory analyses of TPH-d (EPA Method 8015B), VOCs (EPA Method 8260B), and PAHs (EPA Method 8310). Results are summarized on Table 2-3 and Figure 2-7. TPH-d was detected in MW14137-2, located cross-gradient of the former tank cavity, at a concentration of 2.2 mg/L. No TPH-d was detected in wells MW14137-1, MW14137-3, MW14137-5, and MW14137-6, located cross-gradient and downgradient of the former UST. Low concentrations of TPH-d were detected at MW14137-7, located downgradient of the former UST at 0.25 and 0.26 µg/L for the sample and duplicate, respectively. Trace concentrations of bromodichloromethane and dibromodichloromethane were also detected in groundwater retrieved from MW14137-7. MTBE was detected at MW14137-2 at a concentration of 9.5 µg/L and at trace concentrations in MW14137-7. No PAHs were detected in any water sample. The laboratory analytical reports and chain-of-custody form are included in Appendix E.

Prior to sampling, the depth to groundwater was measured at each well. Groundwater elevation data indicated that groundwater was flowing to the south to southeast with a gradient of approximately 0.03 feet/foot. The depth to groundwater at the site ranged from 6.74 to 7.82 feet bgs. Groundwater elevations are summarized on Table 2-6, and elevation contours are shown on Figure 2-7.

The analytical results were successfully uploaded to the Water Board Geotracker database (confirmation number 9669965982).

3.0 ASSESSMENT OF IMPACTS

This section presents information regarding the nature and extent of contamination, site hydrogeology, and an evaluation of potential impacts to nearby resources.

3.1 NATURE AND EXTENT OF CONTAMINATION

Data from site activities indicate that both soil and groundwater have been impacted with petroleum hydrocarbons. Brief descriptions of these impacts are summarized below.

3.1.1 Soil

Soil sample results from the previous site assessment activities (Sections 2.2 and 2.4) suggested that the highest levels of diesel contamination extended from the former tank cavity vertically to approximately 15 feet bgs and did not extend horizontally more than approximately 10 to 15 feet from the former UST.

In February 2006, approximately 208 cubic yards of diesel-impacted soil were excavated from the former tank cavity area (Section 2.6). The excavation extended horizontally 20 feet by 16.5 feet and vertically to 17 feet bgs (Figure 2-5). The horizontal extent of the excavation was limited to the south and west due to the presence of Building 14137. Laboratory results from confirmation soil samples indicated that no detectable TPH-d was present on the east sidewall and TPH-d was present at low levels (14 to 53 mg/kg) along the north sidewall and the excavation bottom. TPH-d, however, was present at relatively high levels along the deep portions of the west and south sidewalls (up to 6,700 mg/kg).

To calculate the volume of the remaining impacted soil near the former tank cavity, it is estimated that impacted soil extends horizontally approximately 5 feet from the west and south sidewalls and is present between approximately 8 to 15 feet bgs on the western sidewall (20 feet long sidewall) and between approximately 7 to 15 feet bgs along the southern sidewall (16.5 feet long sidewall). Based on these assumptions, the estimated volume of impacted soil remaining at the site is approximately 50 cubic yards (cu yds).

3.1.2 Groundwater

Analytical data collected during the most recent groundwater sampling event (March 2006) indicated that TPH-d contamination was present in MW14137-2, located cross-gradient of the former tank cavity, at a concentration of 2.2 mg/L. TPH-d was not detected in wells MW14137-1, MW14137-3, MW14137-5, and MW14137-6, also located cross-gradient and downgradient of the former UST. Very low concentrations of TPH-d were detected at MW14137-7, located downgradient of the former UST, at 2.5 and 2.6 µg/L for the sample and duplicate, respectively.

MTBE was detected at MW14137-2 at a concentration of 9.5 µg/L and at trace concentrations in MW14137-7.

3.2 GEOLOGY AND HYDROGEOLOGY

MCB Camp Pendleton is situated in the Peninsular Ranges Geomorphic Province. In the east, the province consists of mountain ranges (Peninsular Ranges) that divide the Colorado Desert Geomorphic Province from this province. Geomorphic characteristics found in the province include mountain slopes, foothills, inland valleys, coastal valleys, coastal slopes, and coastal plains. Generally, MCB Camp Pendleton contains all these features, which slope to the west from the mountains located near the eastern border of the Base (with the exception of a low coastal mountain range).

The geology at UST Site 14137 primarily consists of a relatively thin layer of artificial fill material consisting of brown silty sand with some gravel overlying weathered granitic bedrock. The weathered granitic bedrock is first encountered approximately 5 to 10 feet bgs and is part of a Cretaceous igneous intrusion that underlies this part of the Base.

The site is relatively flat and the nearest surface water body, a tributary of Pilgrim Creek, is approximately 350 feet south of the site. Surface water from Pilgrim Creek has designated beneficial uses for agricultural supply, industrial service supply, contact water recreation, non-contact water recreation, warm freshwater habitat, and wildlife habitat.

Groundwater generally occurs at UST Site 14137 at approximately 7 to 8 feet bgs. According to the *Water Quality Control Plan for the San Diego Basin* (RWQCB, 1994), UST Site 14137 is located in the Mission Hydrologic Subarea of the Lower San Luis Hydrologic Area within the San Luis Rey Hydrologic Unit. Groundwater in this area has beneficial uses including municipal and domestic supply, agricultural supply, industrial process supply, and industrial service supply. However, no groundwater supply wells are located within 1.5 miles of the site.

3.3 EVALUATION OF POTENTIAL IMPACTS

Groundwater at MCB Camp Pendleton has designated municipal/domestic use. To assess the potential UST Site 14137 may have to impact groundwater and other nearby resources, the site was evaluated with criteria related to the effectiveness of the contaminant source removal, site characterization, stability of the groundwater plume, identification of potential nearby sensitive receptors, and whether the site poses a significant risk to human health or the environment. The criteria are presented below, along with applicable information from the site.

1. *The leak has been stopped and ongoing sources have been removed or remediated to the extent practicable.*

- The former diesel underground storage tank and the associated piping were removed from the site in October 1996 (Section 2.3).
- In February 2006, a total of approximately 208 cubic yards of hydrocarbon-impacted soil were excavated from the former tank cavity area (Section 2.6). After the excavation, soil confirmation samples did not detect TPH-d on the east sidewall and low levels of TPH-d (14 to 53 mg/kg) were present along the north sidewall and the excavation bottom. TPH-d was detected in the lower portion of the south sidewall (6,700 mg/kg TPH-d) and the lower portion of the west sidewall (1,600 mg/kg TPH-d), but the excavation could not be extended to the west and south because of the presence of Building 14137. It is estimated that approximately 50 cubic yards of TPH-d-impacted soil remain at the site.

2. *The site has been adequately characterized.*

- An initial site investigation was completed on December 31, 1991, and January 30 and 31, 1992. Seven soil borings were drilled and sampled to total depths ranging from 10 to 25 feet bgs, and three of the borings were completed as groundwater monitoring wells (Section 2.2).
- Additional site assessment activities were completed in 1998 and 2000 to further characterize the nature and extent of hydrocarbon contamination in soil and groundwater. A total of six soil borings were drilled and sampled up to 20 feet bgs, and three of the borings were completed as groundwater monitoring wells (Section 2.4). One round of groundwater sampling was completed.
- Soil excavation activities were completed in February 2006 to remove as much hydrocarbon-impacted soil as practical (Section 2.6). After the excavation, eight confirmation soil samples, plus one duplicate, were collected from the excavation sidewalls and bottom to characterize the amount of TPH-d in remaining soils. Selected samples were additionally analyzed for SPLP/TPH-d, SPLP/VOCs, SPLP/PAHs, and total heterotrophic hydrocarbon degraders and diesel-oxidizing degraders. Results indicated that hydrocarbon degrading populations are naturally present in subsurface soils. These results were discussed in detail in Section 2.6.1.
- Based on the above listed drilling, sampling, and soil excavation activities, it is believed soil impacts at the site have been adequately characterized.

3. *The dissolved hydrocarbon plume is not migrating.*

- During the recently completed groundwater sampling event (March 2006), relatively low levels of TPH-d were detected in groundwater. The maximum level of TPH-d detected was 2.2 mg/L at MW14137-2, located cross-gradient of the former UST. Very low concentrations of TPH-d (0.25 mg/L) were detected at MW14137-7, downgradient of the former UST. No detectable concentrations of TPH-d were detected in other cross-gradient wells.

4. *No water wells, deeper drinking water aquifers, surface water, or sensitive receptors are likely to be impacted.*

- Based on the *Marine Corps Base Camp Pendleton Environmental Operations Map* (MCB Camp Pendleton, 2003), the nearest potential sensitive receptor is a riparian habitat area approximately 150 feet east of the site. In addition, a California gnatcatcher 150-meter buffer zone is approximately 300 feet northeast of the site. None of these areas are expected to be impacted by UST Site 14137.
- The nearest municipal groundwater supply well is over 1.5 miles west of the site and is not expected to be impacted.
- The nearest surface water body, a tributary of Pilgrim Creek, is approximately 350 feet south of the site. Because of the relatively low hydraulic gradients across the site, the apparent relatively low levels of groundwater contamination, and the remaining low volume of impacted soil beneath Building 14137, the potential for nearby surface water bodies to be impacted by UST Site 14137 is considered insignificant.

5. *The site presents no significant risk to human health.*

- It is extremely unlikely for humans to be exposed to impacted soil because the remaining impacted soil is beneath Building 14137.
- The only potential for human exposure to contaminants in groundwater is through nearby water supply wells. However, the potential for exposure through groundwater is not anticipated because of the long distance to the nearest supply well (over 1.5 miles).

6. *The site presents no significant risk to the environment.*

- The nearest potential sensitive receptor is a riparian habitat area approximately 150 feet east of the site. For the same reasons that nearby surface waste is not anticipated to be at risk, environment and nearby ecological receptors are not at risk. The riparian habitat is not located near the remaining impacted soil, which is beneath Building 14137.

Based on the above criteria, it is believed that the soil at UST Site 14137 has been adequately characterized. It is believed that since the volume of remaining hydrocarbon-impacted soil is relatively small and there are abundant hydrocarbon degraders naturally present in site soils, the soil does not present a significant risk to human health or the environment. However, because of the limited amount of groundwater sampling that has occurred at the site, especially at new well MW14137-7 located downgradient to the former tank cavity, it is believed that the Water Board will require additional groundwater sampling before site closure can be thoroughly evaluated.

4.0 ASSESSMENT OF CLEANUP REQUIREMENTS

Remediation of UST Site 14137 is monitored by the Water Board, San Diego Region, which has final review and signature authority for closure. The *San Diego County Site Assessment and Mitigation Manual 2004* (San Diego County DEH, 2004) provides a framework for investigating and remediating releases of petroleum products; however, cleanup goals are specified in other regulations and guidance. Applicable regulations and guidance for UST sites come from state and federal codes, various resolutions, and guidance documents. The following sections focus on cleanup levels and regulations guiding corrective action for residual contamination.

4.1 APPLICABLE CLEANUP LEVELS

Cleanup levels for UST Site 14137 are directly related to the Basin Plan (RWQCB, 1994). The Basin Plan provides cleanup standards, water quality objectives (WQOs) or Maximum Contaminant Levels (MCLs), for groundwater hydrologic units based on beneficial-use designations. A hydrologic unit may be designated for one or more of 23 beneficial uses, such as municipal and domestic supply, agricultural supply, industrial service supply, and so forth. The WQOs for a hydrologic unit must be protective of the most sensitive beneficial use designated for the applicable hydrologic unit. The municipal supply category, which includes sources of drinking water, requires the most protective standards for groundwater.

The Water Board has designated all groundwater at MCB Camp Pendleton located east of Interstate 5 to be current or potential sources of drinking water. Groundwater designated for use “as domestic or municipal supply shall not contain concentrations of chemical constituents in excess of MCLs” nor shall these waters “contain taste and odor producing substances in concentrations which cause nuisance or adversely affect beneficial uses” (RWQCB, 1994). Therefore, groundwater that is considered a potential source of drinking water cannot contain contaminant concentrations in excess of MCLs (or WQOs) and/or taste and odor water quality thresholds. Cleanup goals for soils are established so that impacted soil does not have the potential to leach contaminants into groundwater at levels above the groundwater cleanup goals. Therefore, as summarized in Table 4-1 and based on the above requirements, groundwater and soil cleanup goals for typical diesel fuel constituents are directly related to WQOs and MCLs.

4.2 CORRECTIVE ACTION

In addition to regulatory requirements on cleanup levels, California regulations specify corrective action requirements for restoring sites to appropriate cleanup levels. In particular, California State Water Resources Control Board Resolution No. 92-49 (as amended on April 21, 1994 and October 2, 1996) provides policies and procedures for corrective action of unauthorized discharges under Water Code Section 13304. This resolution directs that water affected by an unauthorized release attain either background water quality or the best water

quality that is reasonable if background water quality cannot be restored; however, it does not require that the requisite level of water quality be met at the time of site closure. Also, according to Resolution 92-49, site cleanup must be “consistent with the maximum benefit to the people of state” considering “all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible.” Therefore, corrective action should be reasonable and cost effective with respect to the site-specific conditions.

In Section 5.0, remedial alternatives for UST Site 14137 are identified and evaluated in terms of effectiveness, implementability, and cost.

5.0 IDENTIFICATION AND EVALUATION OF REMEDIAL ALTERNATIVES

This section presents the screening and evaluation process for identifying appropriate remedial alternatives for UST Site 14137. Remedial alternatives screened and evaluated in this CAP are directed at both soil and groundwater. A range of remedial technologies are identified and screened in Section 5.1 in order to select technologies that are expected to be effective, implementable, and cost-effective based on site-specific conditions. Technologies that are not appropriate for the site are eliminated early to streamline the technology evaluation process.

5.1 REMEDIAL TECHNOLOGY SCREENING

The Water Board requires that a minimum of two corrective action strategies be evaluated. To identify the two most appropriate potential technologies for both soil and groundwater, a variety of remedial options were initially screened. A summary of the screening process for soils is included in Table 5-1, and for groundwater, it is included on Table 5-2. The purpose of this screening is to identify and eliminate from further consideration remedial technologies that, because of site-specific conditions or costs, are not the most feasible and/or practical. Based on the screening (see Tables 5-1 and 5-2), the remedial action technologies determined to be the most practical for soil and groundwater at UST Site 14137 are:

Soil Remediation Alternatives:

- Alternative 1: No Further Action
- Alternative 2: Excavation with Off-site Disposal

Groundwater Remediation Alternatives:

- Alternative 1: No Further Action
- Alternative 2: Remediation by Monitored Natural Attenuation (MNA)

The following sections describe each above identified alternative and include evaluations of effectiveness, implementability, and cost. The evaluation of effectiveness includes consideration of overall protection of human health and the environment and both the long-term and short-term effectiveness of each alternative. Evaluation of the implementability of each alternative includes consideration of the technical and administrative feasibility. The cost evaluation of each alternative is based upon estimates for capital costs and, if applicable, long-term monitoring costs. Water Board acceptance of the CAP requires that the responsible party address the Water Board's comments and concerns for each alternative. The Water Board's acceptance may also not be completed until the public has had a chance to comment on the CAP and the comments have been addressed.

5.2 REMEDIAL ALTERNATIVES FOR SOIL

The following sections describe the two most applicable remedial alternatives, as determined during the alternative screening (Table 5-1), for remaining impacted soil at UST Site 14137.

5.2.1 Alternative 1: No Further Action

Under the no further action alternative, no additional soil remediation is proposed for the site. The remaining estimated 50 cubic yards of impacted soil would be left in place and is expected to further remediate via natural processes. Since the remaining contamination is minimal and nearby sensitive receptors, drinking water wells, surface water bodies, and so forth, are not expected to be adversely impacted (Section 3.3), the expense associated with additional active remediation would be an unnecessary use of public resources.

5.2.1.1 Effectiveness

The no further action alternative is expected to provide for permanent long-term reduction of remaining hydrocarbon contamination in soil at UST Site 14137. This would be effective in consideration of the following:

- The source of the diesel contamination, the leaking UST, has been removed.
- Soil excavation activities removed a majority of diesel-impacted soils at the former tank cavity. The soil excavation removed approximately 208 yards of impacted soil and extended to 17 feet bgs, which is approximately 9 to 10 feet below groundwater.
- Laboratory results from excavation confirmation soil samples indicated that no detectable TPH-d was present on the east sidewall and TPH-d was present at low levels (14 to 53 mg/kg) along the north sidewall and the excavation bottom. However, TPH-d was present along the deep portions of the west and south sidewalls (up to 6,700 mg/kg). The excavation could not be extended to the west and south due to the presence of Building 14137.
- Groundwater data from the most recent groundwater sampling event (March 2006) indicated that TPH-d contamination was present in MW14137-2, located cross-gradient of the former tank cavity (2.2 mg/L), and in MW14137-7 at low concentrations approximately 80 feet downgradient. These results indicate that potential groundwater contamination around the former tank cavity has not migrated downgradient to any significant extent.
- It is estimated that approximately 50 cubic yards of hydrocarbon-impacted soil remain at the site. This estimate is based on results from excavation confirmation samples and the assumption that contamination extends approximately 5 feet beyond the south and west sidewalls of the excavation under Building 14137.
- A soil sample collected from the west sidewall of the excavation (at approximately 13 feet bgs) was analyzed for the presence of total aerobic heterotrophic bacteria and total diesel-oxidizing bacteria. Results indicated that $2.5E^{+03}$ total aerobic heterotrophic bacteria and

1.66E⁺⁰³ total diesel-oxidizing bacteria are naturally present in site soils. The bacteria populations are considered optimal by EPA for natural attenuation (EPA, 1995).

- Based on the distance to the nearest municipal supply well (1.5 miles) and the distance to the nearest sensitive ecological receptor (riparian habitat approximately 150 feet to the east), the likelihood of diesel contamination from this site impacting human or sensitive ecological receptors is considered insignificant.

Considering current site conditions, the no further action alternative is considered an effective alternative that is protective of human health and the environment.

5.2.1.2 Implementability

The no further action alternative for soil at the site is easy to implement because no further remediation activities would be conducted.

5.2.1.3 Cost

There are no costs associated with the no further action alternative for soil.

5.2.2 Alternative 2: Excavation with Off-Site Disposal

Excavation with off-site disposal includes removing the remaining TPH-d-impacted soils from along the west and south sidewalls of the previous excavation beneath Building 14137. It is estimated that approximately 50 cubic yards of hydrocarbon-impacted soil remain on the site. Alternative screening analyses (Table 5-1) indicated that potential *in situ* remedial options would not be effective because of the relatively impermeable soils (decomposed granitic rock) present at the site.

Before the excavation would begin, the overhead electrical and communication lines located near the former tank cavity would need to be rerouted. To remove impacted soil along the sidewalls beneath Building 14137 would require supporting the building. The excavation would also likely require shoring since the excavation would extend approximately 10 feet below groundwater. The excavation would proceed until the presence of hydrocarbon contamination was no longer present and confirmation samples indicated that soil cleanup levels were met. The excavation would then be backfilled and the overhead utilities placed back into their original configuration.

5.2.2.1 Effectiveness

For soils, excavation and off-site disposal is a very effective alternative as it protects human health and the environment by removing the contamination and transferring it to an appropriately permitted facility. Excavation provides a permanent removal of the impacted soils.

5.2.2.2 Implementability

Excavation is a well-established, conventional technology for remediating contaminated soil; however, excavation of the current remaining impacted soils at UST Site 14137 is considered difficult since the impacted areas are located beneath Building 14137, and groundwater is present at approximately 7 to 8 feet bgs.

5.2.2.3 Cost

The following assumptions were made to develop a cost estimate for the excavation with off-site disposal alternative:

- An estimated 100 cubic yards of soil, including the estimated 50 cubic yards of impacted soil, would be excavated. The impacted soils would be transported off site for disposal as a non-hazardous waste.
- Prior to the excavation activities, an engineering plan would be required to determine the best method of supporting Building 14137, since the building is located above the soil contamination.
- Since two sides of Building 14137 are located near the area of excavation, shoring would also be required to protect the Building.
- The above ground electrical and communication lines around the former tank cavity would need to be temporarily rerouted prior to the excavation.

The total estimated cost for the excavation with off-site disposal alternative is approximately \$114,250. A general breakdown of the estimated costs is included below:

<u>Task</u>	<u>Estimated Cost</u>
Remedial Action Work Plan (draft and final versions)	\$15,000
Utility rerouting (\$3,000), building support (\$15,000), and shoring (\$10,000)	\$29,000
Soil excavation, backfill, and site restoration (approximately 100 cubic yards of soil, estimated \$125/yard)	\$12,500
Confirmation soil sample analyses [10 x \$90 (TPH-d) + 10 x \$180 (VOCs) + 10 x \$176 (PAHs)]	\$4,500
Transport and dispose of contaminated soil (100 cubic yards = 150 tons) (\$55/ton)	\$8,250
Site supervision (2.5 weeks for construction supervisor at \$110/hour and health and safety support at \$85/hour)	\$25,000
Site Closure Report (draft and final versions)	\$20,000
Total Estimated Cost:	<u>\$114,250</u>

5.3 REMEDIAL ALTERNATIVES FOR GROUNDWATER

The following sections describe the two most applicable remedial alternatives, as determined during the alternative screening (Table 5-2), for impacted groundwater at UST Site 14137.

5.3.1 Groundwater Alternative 1: No Further Action

Under the no further action alternative, no groundwater remediation is proposed for the site. It is, however, presumed that:

1. The relatively low levels of TPH-d currently present in groundwater will be remediated via natural processes.
2. Nearby sensitive receptors have been identified and are not anticipated to be adversely impacted.

It is believed that the minor amounts of diesel components currently present in groundwater (up to 2.2 mg/L of TPH-d) will degrade naturally over time. It is implicit in this alternative that, as contamination levels are low, and there is evidence that hydrocarbon degraders are naturally present in aquifer soils, the expense associated with active remediation would be an unnecessary use of public resources.

5.3.1.1 Effectiveness

The no further action alternative for groundwater would be effective in providing protection of human health and the environment in consideration of the following:

- The source of the diesel contamination, the leaking UST, has been removed.
- Soil excavation activities removed a majority of diesel-impacted soils at the former tank cavity. The soil excavation removed approximately 208 yards of impacted soil and extended to 17 feet bgs, which is approximately 9 to 10 feet below groundwater.
- Groundwater data from the most recent groundwater sampling event (March 2006) indicated that TPH-d contamination was present in MW14137-2, located cross-gradient of the former tank cavity (2.2 mg/L), and in MW14137-7 at low concentrations approximately 80 feet downgradient. These results indicate that potential groundwater contamination around the former tank cavity has not migrated downgradient to any significant extent.
- A soil sample collected from the west sidewall of the excavation (at approximately 13 feet bgs) was analyzed for the presence of total aerobic heterotrophic bacteria and total diesel-oxidizing bacteria. Results indicated that $2.5E^{+03}$ total aerobic heterotrophic bacteria and $1.66E^{+03}$ total diesel-oxidizing bacteria are naturally present in aquifer soils. The bacteria populations are considered optimal by EPA for natural attenuation (EPA, 1995).
- Based on the distance to the nearest municipal supply well (1.5 miles) and the distance to the nearest sensitive ecological receptor (riparian habitat approximately 150 feet to the

east), the likelihood of diesel contamination from this site impacting human or sensitive ecological receptors is considered insignificant.

Considering site conditions, the no further action alternative for groundwater is considered an effective alternative that is protective of human health and the environment.

5.3.1.2 Implementability

The no further action alternative for groundwater is very easy to implement, as no groundwater remediation or monitoring activities would be conducted. After regulatory approval for closure, the groundwater monitoring wells at the site would be properly destroyed.

5.3.1.3 Cost

The only costs associated with the No Further Action alternative would be to properly destroy and document the destruction of the existing groundwater monitoring wells. The estimated cost is for the no further action alternative is \$16,385.

A summary of estimated costs is presented below:

<u>Task</u>	<u>Estimated Cost</u>
Well destruction permits (six wells)	\$785
Drilling subcontractor (\$900 x 6 wells)	\$5,400
Labor for subcontractor coordination and oversight	\$3,500
Transport and dispose of well abandonment debris and soil cuttings	\$3,200
Well destruction documentation	<u>\$3,500</u>
Total Estimated Cost:	<u>\$16,385</u>

5.3.2 Alternative 2: Remediation by Monitored Natural Attenuation

Alternative 2, remediation by MNA, relies on natural attenuation mechanisms for the remediation of residual groundwater contamination, and for this alternative, it is proposed that MNA include periodic groundwater monitoring to verify that natural attenuation processes are occurring. With regard to groundwater, natural attenuation is generally defined as a process by which contaminants are degraded, or reduced in concentration, by various naturally occurring processes. Major natural attenuation processes include biodegradation, dispersion, dilution, volatilization, and adsorption. The MNA alternative for groundwater is expected to provide for permanent, long-term reduction of contaminants.

5.3.2.1 Effectiveness

For groundwater, MNA is expected to effectively provide for protection of human health and the environment for the same reasons as described above for the no further action alternative. Those reasons are reiterated here:

- The source of the diesel contamination, the leaking UST, has been removed.
- Soil excavation activities removed a majority of diesel-impacted soils at the former tank cavity. The soil excavation removed approximately 208 yards of impacted soil and extended to 17 feet bgs, which is approximately 9 to 10 feet below groundwater.
- Groundwater data from the most recent groundwater sampling event (March 2006) indicated that TPH-d contamination was present in MW14137-2, located cross-gradient of the former tank cavity (2.2 mg/L), and in MW14137-7 at low concentrations approximately 80 feet downgradient. These results indicate that potential groundwater contamination around the former tank cavity has not migrated downgradient to any significant extent.
- A soil sample collected from the west sidewall of the excavation (at approximately 13 feet bgs) was analyzed for the presence of total aerobic heterotrophic bacteria and total diesel-oxidizing bacteria. Results indicated that $2.5E^{+03}$ total aerobic heterotrophic bacteria and $1.66E^{+03}$ total diesel-oxidizing bacteria are naturally present in site soils. The bacteria populations are considered optimal by EPA for natural attenuation (EPA, 1995).
- Based on the distance to the nearest municipal supply well (1.5 miles) and the distance to the nearest sensitive ecological receptor (riparian habitat approximately 150 feet to the east), the likelihood of diesel contamination from this site impacting human or sensitive ecological receptors is considered insignificant.

In consideration of these points, the MNA for groundwater alternative is considered an effective remedial alternative for this site.

5.3.2.2 Implementability

MNA is moderately easy to implement, as no active remediation activities would be conducted. Implementation of MNA would consist of collecting groundwater samples from existing monitoring wells over time to assess contaminant concentrations and biological activity.

5.3.2.3 Cost

The following assumptions were made to develop a cost estimate for the MNA alternative for groundwater:

- One year of quarterly groundwater monitoring would be required to confirm that levels of groundwater contamination are not increasing and the plume is not expanding.

- Fate and transport modeling will not be required to predict contaminant reduction and/or migration, nor would a contingency plan be required to address the possibility that contaminant reduction will not occur as estimated, because: 1) contaminants are already low in wells located downgradient from the former tank cavity and 2) impacts to human or sensitive ecological receptors are not expected.

The total cost associated with the MNA alternative for groundwater (including properly abandoning and documenting the destruction of the existing groundwater monitoring wells at closure) is approximately \$87,653. A general breakdown of the estimated costs is included below:

<u>Task</u>	<u>Estimated Cost</u>
Quarterly groundwater sampling field labor for 1 year (4 events x 2 persons x 10 hrs/event x \$85/hr)	\$6,800
Groundwater sample analysis (7 samples TPH-d (\$90)/event + 7 samples VOCs (\$180)/event + 7 samples PAHs (\$176)/event)	\$12,488
Transport and dispose well purge water (4 events)	\$3,400
Quarterly Groundwater Sampling Reports (\$9,500/report x 4 reports)	\$38,000
Closure Report	\$12,000
Well destruction and documentation (see Section 5.3.1.3)	\$14,965
Total Estimated Cost:	<u>\$87,653</u>

6.0 RECOMMENDATIONS

The no further action alternative for soil and the MNA alternative for groundwater are the requested alternatives for UST Site 14137. This request is supported based on the following:

- **Source Removal.** In 1996, the UST and associated piping were removed from the site. In February 2006, TPH-d-impacted soil was excavated (208 cubic yards) to the extent practical around the former tank cavity. After the excavation, soil confirmation samples did not detect TPH-d on the east sidewall, and low levels of TPH-d (14 to 53 mg/kg) were present along the north sidewall and the excavation bottom. TPH-d was detected in the lower portion of the south sidewall (6,700 mg/kg TPH-d) and the lower portion of the west sidewall (1,600 mg/kg TPH-d), but the excavation could not be extended to the west and south because of the presence of Building 14137. It is estimated that approximately 50 cubic yards of TPH-d-impacted soil remains at the site (Section 3.1.1). The costs estimated to remove the remaining impacted soil from beneath the building are considered high (Section 5.2.2.3) and are not believed to be warranted for the relatively small amount of hydrocarbon contamination remaining.

It is believed that since the remaining small volume of impacted soil does not present a significant risk to human health or the environment (see Section 3.3) and naturally occurring total aerobic heterotrophic bacteria and total diesel-oxidizing bacteria in soil are present at levels above those considered optimal (EPA, 1995), no further action for soil is an effective and cost efficient alternative for Site 14137.

- **Extent of Remaining Soil Contamination.** Soil excavation activities around the former tank cavity extended horizontally 20 feet by 16.5 feet and vertically to 17 feet bgs. Laboratory results from confirmation soil samples indicated that no detectable TPH-d was present on the east sidewall and TPH-d was present at low levels (14 to 53 mg/kg) along the north sidewall and the excavation bottom, but was present along the deep portions of the west and south sidewalls (up to 6,700 mg/kg). The impacted soil remaining near the former tank cavity is estimated to extend approximately 5 feet from the west and south sidewalls beneath Building 14137 between approximately 8 to 15 feet bgs on the western sidewall and between approximately 7 to 15 feet bgs along the southern sidewall. It is estimated that approximately 50 cubic yards of TPH-d-impacted soil remain at the site.
- **Groundwater Plume Stability.** Groundwater data from the most recent groundwater sampling event (March 2006) indicated that TPH-d contamination was present in MW14137-2, located cross-gradient of the former tank cavity (2.2 mg/L), and in MW14137-7 at low concentrations approximately 80 feet downgradient. These results indicate that potential groundwater contamination around the former tank cavity has not migrated downgradient to any significant extent. However, because of the relatively limited amount of groundwater sampling that has occurred at the site, especially at new well MW14137-7 located downgradient of the site, it cannot be concluded with any certainty that the plume is not expanding.
- **Risk.** Based on the distance to the nearest municipal supply well (1.5 miles), the distance to the nearest surface water (a small tributary to Pilgrim Creek approximately

350 feet south of the site), the absence of significant groundwater contaminants downgradient of the former tank cavity, the low volume of remaining soil contamination (estimated 50 cubic yards), the distance to the nearest sensitive ecological receptor (a riparian habitat approximately 150 feet to the east), and the presence of total heterotrophic hydrocarbon degraders and diesel-oxidizing degraders in aquifer soils at levels above those considered optimal (suggesting that natural attenuation is actively occurring at the site), the likelihood of diesel contamination from this site impacting human or sensitive ecological receptors is considered extremely small to negligible.

- **Cost.** The costs for excavation with off-site disposal for the remaining estimated 50 cubic yards of impacted soils (\$114,250) are significant when considering that the remaining impacted soil is not believed to be a threat to human health or nearby sensitive ecological receptors. Such expenditures for additional active soil remediation are believed to be an unnecessary use of public resources. Perhaps equally or more importantly, such expenditures would, in light of MCB Camp Pendleton's limited budget for environmental remediation, result in decreased availability of funds for remediation of sites that actually pose risks to human health or the environment.

The costs for MNA for groundwater (\$87,653) are considered necessary to evaluate potential seasonal changes in water quality, especially recently installed downgradient well MW14137-7, and to establish a high degree of certainty in the data to support regulatory site closure.

- **Time Frame.** Data collected for this site indicate that the tank has been removed, the majority of contaminated soils have been removed, the remaining impacted soils (estimated 50 cubic yards) are not believed to be a significant source of continued contaminant release, groundwater downgradient around the former tank cavity is not significantly impacted, conditions for biodegradation are favorable (hydrocarbon degraders are naturally present in aquifer soils at levels considered optimal [EPA, 1995]), contaminants are extremely unlikely to impact nearby sensitive receptors and the nearest municipal supply well (located 1.5 miles away), and groundwater in the immediate area is not expected to be used for any purpose in the foreseeable future. In consideration of all of the available information, it is believed that residual hydrocarbon contamination will be naturally remediated within a reasonable time frame.

In summary, since there are no known current pathways for exposure to the remaining relatively small volume of impacted soils (estimated 20 cubic yards), remaining impacted soils are not believed to be a source of contaminant release, and the costs associated with removing the remaining impacted soils is considered significant, the no further action alternative for soil is requested for UST Site 2389. However, since seasonal groundwater quality data have not been obtained from the site, the MNA alternative is requested for groundwater. It is recommended that 1 year of quarterly groundwater sampling be completed to evaluate potential seasonal changes in groundwater quality, and to obtain a high degree of confidence that groundwater is not impacted.

7.0 REFERENCES

- California State Water Quality Control Board. 1996. Resolution No. 92-49 (As Amended on April 21, 1994 and October 2, 1996). Policies and procedures for corrective action of unauthorized discharges under Water Code Section 13304
- _____. Resolution No. 95-96.
- Marine Corps Base Camp Pendleton, Assistant Chief of Staff, Environmental Security. 2003. *Marine Corps Base Camp Pendleton Environmental Operations Map*. September.
- Regional Water Quality Control Board (RWQCB). 1994. *Water Quality Control Plan for the San Diego Basin* (Basin Plan), 1994 (amended).
- San Diego County Department of Environmental Health (DEH), Land and Water Quality Division. 2004. *San Diego County Site Assessment and Mitigation Manual 2004*.
- SES-TECH, 2005. *Final Interim Remedial Action Work Plan for UST Site 14137, MCB Camp Pendleton, Revision I*. September.
- Southwest Division Naval Facilities Engineering Command. 1997. *Marine Corps Base Camp Pendleton, California, Remedial Investigation/Feasibility Study, Remedial Investigation for Group D Sites. Revision 0. Draft Final*. With Jacobs Engineering Group and CH2M Hill. July.
- SOTA Environmental Technology, Inc. (SOTA). 2001. *Final Site Assessment Report for Underground Storage Tank (UST) at Site 14137, Marine Corps Base (MCB) Camp Pendleton, California*. April.
- United States Environmental Protection Agency (EPA). 1995. *How to Evaluate Alternative Cleanup Technologies for Underground Storage Tank Sites: A Guide for Corrective Action Plan Reviewers*. EPA 510-B-95-007. May.
- _____. 2004. *Preliminary Remediation Goals*. October.

TABLES

TABLE 2-1

**INITIAL SITE ASSESSMENT SOIL SAMPLE RESULTS (1991/1992) AND UST REMOVAL SOIL
SAMPLE RESULTS (1996),
UST SITE 14137, MCB CAMP PENDLETON, CALIFORNIA**

Date	Sample ID	TPH-d	TPH-g	Benzene	Toluene	Ethylbenzene	Xylenes	TRPH
		(mg/kg)						
Initial Investigation Results								
12/3/91	B14137-1-5	--	--	--	--	--	--	ND <10
12/3/91	B14137-1-8	--	--	--	--	--	--	114
12/3/91	B14137-1-8D	--	--	--	--	--	--	123
12/3/91	B14137-1-10	--	--	--	--	--	--	ND <10
12/3/91	B14137-1-19	--	--	--	--	--	--	ND <10
12/3/91	GS14137-1-19	--	--	--	--	--	--	11.9
1/31/92	B14137-2-5	--	--	--	--	--	--	ND <10
1/31/92	B14137-2-10	--	--	--	--	--	--	ND <10
1/31/92	B14137-2-15	--	--	--	--	--	--	ND <10
1/31/92	B14137-2-19	--	--	--	--	--	--	ND <10
1/31/92	B14137-2-19D	--	--	--	--	--	--	ND <10
1/31/92	B14137-3-5	--	--	--	--	--	--	60*
1/31/92	B14137-3-10	--	--	--	--	--	--	ND <10
1/31/92	B14137-4-5	--	--	--	--	--	--	ND <10
1/31/92	B14137-4-15	--	--	--	--	--	--	ND <10
2/18/92	MW14137-1-5	--	--	--	--	--	--	ND <10
2/18/92	MW14137-1-10	--	--	--	--	--	--	ND <10
2/18/92	MW14137-1-25	--	--	--	--	--	--	ND <10
2/18/92	MW14137-2-5	--	--	--	--	--	--	ND <10
2/18/92	MW14137-2-5D	--	--	--	--	--	--	ND <10
2/18/92	MW14137-2-15	--	--	--	--	--	--	ND <10
2/18/92	MW14137-2-20	--	--	--	--	--	--	ND <10
2/18/92	MW14137-3-5	--	--	--	--	--	--	ND <10
2/18/92	MW14137-3-10	--	--	--	--	--	--	177
2/18/92	MW14137-3-10D	--	--	--	--	--	--	252
2/18/92	MW14137-3-15	--	--	--	--	--	--	52
2/18/92	MW14137-3-20	--	--	--	--	--	v	ND <10
UST Removal Results								
10/18/1996	14137-A-9'	7,900	ND < 10					
10/18/1996	14137-B-9'	10,000	ND < 10	--	--	--	--	--
10/18/1996	14137-C-1.0'	ND < 10	ND < 10					

Notes:

* - sample contained asphalt

-- - not analyzed

MCB - Marine Corps Base

mg/kg - milligrams per kilogram

ND - not detected above laboratory reporting limits

TPH-d - total petroleum hydrocarbons quantified as diesel

TPH-g - total petroleum hydrocarbons quantified as gasoline

TRPH - total recoverable petroleum hydrocarbons

UST - Underground Storage Tank

TABLE 2-2

SITE INVESTIGATION STATIONARY LABORATORY ANALYTICAL RESULTS FOR SOIL
UST SITE 14137, MCB CAMP PENDELTON, CALIFORNIA

Component Analyzed	Method	Unit	PQL	MW14137-4 @ 5'	MW14137-4 @ 10'	MW14137-4 @ 15'	B14137-7 @ 5'	B14137-7 @ 10'	B14137-7 @ 15'	B14137-5 @ 5'	B14137-5 @ 10'	B14137-5 @ 15'	MW14137-5 @ 5'	MW14137-5 @ 10'	MW14137-5 @ 15'	B14137-6 @ 5'	B14137-6 @ 10'	B14137-6 @ 15'	MW14137-6 @ 5'	MW14137-6 @ 10'	MW14137-4A @ 10'	MW14137-4A @ 15'	MW14137-4A @ 20'		
Date Collected				11/4/98	11/4/98	11/4/98	11/5/98	11/5/98	11/5/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	3/11/00	3/11/00	3/11/00	
Stationary Laboratory Analysis - TPH-d, TPH-g, MTBE, BTEX																									
Dilution Factor (Gasoline, BTEX, & MTBE)				5					1					200					1		1				
Gasoline	M8015V	mg/kg	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	300 ^(a)	4.1 ^(a)	0.2J ^(a)		
Benzene	8020	mg/kg	5	--	--	ND <26	--	--	--	--	--	--	--	--	--	--	0.5J	--	--	--	--	--	--		
Ethylbenzene	8020	mg/kg	5	--	--	12J	--	--	--	--	--	--	--	--	--	--	1J	--	--	--	--	--	--		
Toluene	8020	mg/kg	5	--	--	9J	--	--	--	--	--	--	--	--	--	--	2J	--	--	--	--	--	--		
o-Xylene	8020	mg/kg	5	--	--	7J	--	--	--	--	--	--	--	--	--	--	ND <5.2	--	--	--	--	--	--		
m/p-Xylene	8020	mg/kg	10	--	--	17J	--	--	--	--	--	--	--	--	--	--	2J	--	--	--	--	--	--		
Xylenes (Total)	8020	mg/kg	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
MTBE	8020	mg/kg	25	--	--	ND <130	--	--	--	--	--	--	--	--	--	--	ND <26	--	--	--	--	--	--		
Dilution Factor (Diesel & Motor Oil)				5					1					10					1		1				
Diesel	M8015E	mg/kg	10	--	--	730	--	--	--	--	--	--	--	--	--	--	ND <10	--	--	--	5260	50	26		
Motor oil	M8015E	mg/kg	10	--	--	ND <52	--	--	--	--	--	--	--	--	--	--	ND <10	--	--	--	93J	4J	2J		
Mobile Laboratory Analysis - TPH-d, TPH-g, MTBE, BTEX																									
TPH-d	CA DHS	mg/kg	10	130 ^(b)	17 ^(b)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	
TPH-g	CA DHS	mg/kg	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--	
MTBE	8020	mg/kg	0.1	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Benzene	8020	mg/kg	0.05	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Toluene	8020	mg/kg	0.05	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Ethylbenzene	8020	mg/kg	0.05	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Xylenes	8020	mg/kg	0.15	ND	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Stationary Laboratory Results - Volatile Organic Compounds																									
Dilution Factor				10															10			1		1	
Acetone	8260B	mg/kg	100	ND <1100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	220J	69J	48J		
Benzene	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2		
Bromobenzene	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2		
Bromochloromethane	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2		
Bromodichloromethane	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2		
Bromoform	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2		
Bromomethane	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2		
2-Butanone (MEK)	8260B	mg/kg	100	ND <1100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	66J	ND <110	ND <100		
n-Butylbenzene	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2		
sec-Butylbenzene	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	24J	0.9J	ND <5.2		
tert-Butylbenzene	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	0.9J	ND <5.2		
Carbon disulfide	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2		
Carbon tetrachloride	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2		
Chlorobenzene	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2		
Chlorodibromomethane	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2		
1,2-Dibromomethane (EDB)	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2		
Dibromomethane	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2		
1,2-Dichlorobenzene	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2		
1,3-Dichlorobenzene	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2		
1,4-Dichlorobenzene	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2		

TABLE 2-2

SITE INVESTIGATION STATIONARY LABORATORY ANALYTICAL RESULTS FOR SOIL
UST SITE 14137, MCB CAMP PENDELTON, CALIFORNIA

Component Analyzed	Method	Unit	PQL	MW14137-4 @ 5'	MW14137-4 @ 10'	MW14137-4 @ 15'	B14137-7 @ 5'	B14137-7 @ 10'	B14137-7 @ 15'	B14137-5 @ 5'	B14137-5 @ 10'	B14137-5 @ 15'	MW14137-5 @ 5'	MW14137-5 @ 10'	MW14137-5 @ 15'	B14137-6 @ 5'	B14137-6 @ 10'	B14137-6 @ 15'	MW14137-6 @ 5'	MW14137-6 @ 10'	MW14137-4A @ 10'	MW14137-4A @ 15'	MW14137-4A @ 20'
				11/4/98	11/4/98	11/4/98	11/5/98	11/5/98	11/5/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	3/11/00	3/11/00	3/11/00
Date Collected																							
Dichlorodiflouromethane	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2
1,1-Dichloroethane	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2
1,2-Dichloroethane	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2
1,1-Dichloroethene	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2
cis-1,2-Dichloroethene	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2
trans-1,2-Dichloroethene	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2
1,2-Dichloropropane	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2
1,3-Dichloropropane	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2
2,2-Dichloropropane	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2
1,1-Dichloropropene	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2
cis-1,3-Dichloropropane	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2
trans-1,3-Dichloropropene	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2
Ethylbenzene	8260B	mg/kg	5	43J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	22J	ND <5.4	ND <5.2
Hexachlorobutadiene	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2
Isopropylbenzene (Cumene)	8260B	mg/kg	5	9J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	14J	ND <5.4	ND <5.2
p-Isopropyltoluene	8260B	mg/kg	5	80	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	140	9	ND <5.2
Methylene chloride	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10J	ND <5.4	ND <5.2
4-Methyl-2-pentanone (MIBK)	8260B	mg/kg	50	ND <550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <570	ND <54	ND <52
MTBE	8260B	mg/kg	10	ND <110	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <110	ND <11	ND <10
Naphthalene	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2
n-Propylbenzene	8260B	mg/kg	5	19J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	27J	ND <5.4	ND <5.2
Styrene	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2
1,1,1,2-Tetrachloroethane	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2
1,1,2,2-Tetrachloroethane	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2
Tetrachlorethene	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2
Toluene	8260B	mg/kg	5	9J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2
1,2,3-Trichlorobenzene	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2
1,2,4-Trichlorobenzene	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	2J	ND <5.2
1,1,1-Trichloroethane	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2
1,1,2-Trichloroethane	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2
Trichloroethene	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2
Trichloroflouromethane	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2
1,2,3-Trichloropropane	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2
1,2,4-Trimethylbenzene	8260B	mg/kg	5	120	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	260	6	ND <5.2
1,3,5-Trimethylbenzene	8260B	mg/kg	5	90	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	25J	2J	ND <5.2
Vinyl Chloride	8260B	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2
o-Xylene	8260B	mg/kg	5	60	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	24J	ND <5.4	ND <5.2
m/p-Xylene	8260B	mg/kg	5	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	18J	ND <5.4	ND <5.2
Xylenes (Total)	8260B	mg/kg	5	160	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <10.4

TABLE 2-2

SITE INVESTIGATION STATIONARY LABORATORY ANALYTICAL RESULTS FOR SOIL
UST SITE 14137, MCB CAMP PENDELTON, CALIFORNIA

Component Analyzed				Method	Unit	PQL	MW14137-4 @ 5'	MW14137-4 @ 10'	MW14137-4 @ 15'	B14137-7 @ 5'	B14137-7 @ 10'	B14137-7 @ 15'	B14137-5 @ 5'	B14137-5 @ 10'	B14137-5 @ 15'	MW14137-5 @ 5'	MW14137-5 @ 10'	MW14137-5 @ 15'	B14137-6 @ 5'	B14137-6 @ 10'	B14137-6 @ 15'	MW14137-6 @ 5'	MW14137-6 @ 10'	MW14137-4A @ 10'	MW14137-4A @ 15'	MW14137-4A @ 20'		
Date Collected							11/4/98	11/4/98	11/4/98	11/5/98	11/5/98	11/5/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	3/11/00	3/11/00	3/11/00
Stationary Laboratory Results - Polynuclear Aromatic Hydrocarbons (PAH)																												
Dilution Factor							10																		10	1	1	
Acenaphthene	8310	mg/kg	50	ND <550	--																				ND <570	ND <54	ND <52	
Acenaphthylene	8310	mg/kg	20	ND <220	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <230	ND <22	ND <21	
Anthracene	8310	mg/kg	2	30	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	55	0.6J	0.5J	
Benz[a]anthracene	8310	mg/kg	2	40	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	180	3	2	
Benzo[a]pyrene	8310	mg/kg	2	ND <22	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <23	ND <2.2	ND <2.1	
Benzo[b]fluoranthene	8310	mg/kg	2	ND <22	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <23	ND <2.2	ND <2.1	
Benzo[g,h,i]perylene	8310	mg/kg	2	ND <22	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <23	ND <2.2	ND <2.1	
Benzo[k]flouranthene	8310	mg/kg	2	ND <22	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <23	ND <2.2	ND <2.1	
Chrysene	8310	mg/kg	2	30	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	54	0.5J	0.4J	
Dibenz[a,h]anthracene	8310	mg/kg	5	ND <55	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <57	ND <5.4	ND <5.2	
Flouranthene	8310	mg/kg	2	120	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <23	ND <2.2	ND <2.1	
Flourene	8310	mg/kg	2	58	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <23	ND <2.2	ND <2.1	
Indeno[1,2,3-cd]pyrene	8310	mg/kg	2	ND <22	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <23	ND <2.2	ND <2.1	
Naphthalene	8310	mg/kg	50	ND <550	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	250J	ND <54	ND <52	
Phenanthrene	8310	mg/kg	2	110	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1240	11	12	
Pyrene	8310	mg/kg	2	130	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <23	ND <2.2	ND <2.1	
Stationary Laboratory Results - SPLP TPH-d, TPH-g, MTBE, BTEX																												
Dilution Factor (Gasoline, BTEX, & MTBE)							10																		10	1		
Gasoline	8021B	mg/L	0.05	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	17.5 ^(a)	0.64 ^(a)	--	
Benzene	8021B	mg/L	0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	0.1J	--	
Toluene	8021B	mg/L	0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	0.4J	--	
Ethylbenzene	8021B	mg/L	0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <0.5	--	
o-Xylene	8021B	mg/L	0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	0.4J	--	
m/p-Xylene	8021B	mg/L	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <10	0.7J	--	
MTBE	8021B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <50	2J	--	
Dilution Factor (Diesel & Motor Oil)							10																		10	1	--	
Diesel	M8015E	mg/L	0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	72	7.8	--	
Motor oil	M8015E	mg/L	0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2J	0.3J	--	

TABLE 2-2

SITE INVESTIGATION STATIONARY LABORATORY ANALYTICAL RESULTS FOR SOIL
UST SITE 14137, MCB CAMP PENDELTON, CALIFORNIA

Component Analyzed	Method	Unit	PQL	MW14137-4 @ 5'	MW14137-4 @ 10'	MW14137-4 @ 15'	B14137-7 @ 5'	B14137-7 @ 10'	B14137-7 @ 15'	B14137-5 @ 5'	B14137-5 @ 10'	B14137-5 @ 15'	MW14137-5 @ 5'	MW14137-5 @ 10'	MW14137-5 @ 15'	B14137-6 @ 5'	B14137-6 @ 10'	B14137-6 @ 15'	MW14137-6 @ 5'	MW14137-6 @ 10'	MW14137-4A @ 10'	MW14137-4A @ 15'	MW14137-4A @ 20'
Date Collected				11/4/98	11/4/98	11/4/98	11/5/98	11/5/98	11/5/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	3/11/00	3/11/00	3/11/00
Stationary Laboratory Results - SPLP Volatile Organics																							
Dilution Factor																					1	1	
Acetone	8260B	mg/L	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	18J	9J	--
Benzene	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
Bromobenzene	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
Bromochloromethane	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
Bromodichloromethane	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
Bromoform	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
Bromomethane	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
2-Butanone (MEK)	8260B	mg/L	100	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6J	5J	--
n-Butylbenzene	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
sec-Butylbenzene	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2J	ND <5	--
tert-Butylbenzene	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
Carbon disulfide	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
Carbon tetrachloride	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
Chlorobenzene	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
Chlorodibromomethane	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
Chloroethane	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
Chloroform	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
Chloromethane	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
2-Chlorotoluene	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
4-Chlorotoluene	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
1,2-Dibromo-3-chloropropane (DB)	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
1,2-Dibromomethane (EDB)	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
Dibromomethane	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
1,2-Dichlorobenzene	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
1,3-Dichlorobenzene	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
1,4-Dichlorobenzene	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
Dichlorodiflouromethane	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
1,1-Dichloroethane	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
1,2-Dichloroethane	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
1,1-Dichloroethene	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
cis-1,2-Dichloroethene	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
trans-1,2-Dichloroethene	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
1,2-Dichloropropane	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
1,3-Dichloropropane	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
2,2-Dichloropropane	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
1,1-Dichloropropene	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
cis-1,3-Dichloropropene	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
trans-1,3-Dichloropropene	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
Ethylbenzene	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2J	ND <5	--

TABLE 2-2

SITE INVESTIGATION STATIONARY LABORATORY ANALYTICAL RESULTS FOR SOIL
UST SITE 14137, MCB CAMP PENDELTON, CALIFORNIA

Component Analyzed	Method	Unit	PQL	MW14137-4 @ 5'	MW14137-4 @ 10'	MW14137-4 @ 15'	B14137-7 @ 5'	B14137-7 @ 10'	B14137-7 @ 15'	B14137-5 @ 5'	B14137-5 @ 10'	B14137-5 @ 15'	MW14137-5 @ 5'	MW14137-5 @ 10'	MW14137-5 @ 15'	B14137-6 @ 5'	B14137-6 @ 10'	B14137-6 @ 15'	MW14137-6 @ 5'	MW14137-6 @ 10'	MW14137-4A @ 10'	MW14137-4A @ 15'	MW14137-4A @ 20'
				11/4/98	11/4/98	11/4/98	11/5/98	11/5/98	11/5/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	3/11/00	3/11/00	3/11/00
Date Collected																							
Hexachlorobutadiene	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
Isopropylbenzene (Cumene)	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1J	ND <5	--
p-Isopropyltoluene	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	15	0.6J	--
Methylene chloride	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1J	0.8J	--
4-Methyl-2-pentanone (MIBK)	8260B	mg/L	50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <50	ND <50	--
MTBE	8260B	mg/L	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <10	ND <10	--
Naphthalene	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
n-Propylbenzene	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
Styrene	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
1,1,1,2-Tetrachloroethane	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
1,1,2,2-Tetrachloroethane	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
Tetrachlorethene	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
Toluene	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
1,2,3-Trichlorobenzene	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
1,2,4-Trichlorobenzene	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
1,1,1-Trichloroethane	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
1,1,2-Trichloroethane	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.8J	ND <5	--
Trichloroethene	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
Trichloroflouromethane	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
1,2,3-Trichloropropane	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
1,2,4-Trimethylbenzene	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	28	0.7J	--
1,3,5-Trimethylbenzene	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3J	ND <5	--
Vinyl Chloride	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <5	--
o-Xylene	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2J	ND <5	--
m/p-Xylene	8260B	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2J	ND <5	--

TABLE 2-2

SITE INVESTIGATION STATIONARY LABORATORY ANALYTICAL RESULTS FOR SOIL
UST SITE 14137, MCB CAMP PENDELTON, CALIFORNIA

Component Analyzed	Method	Unit	PQL	MW14137-4 @ 5'	MW14137-4 @ 10'	MW14137-4 @ 15'	B14137-7 @ 5'	B14137-7 @ 10'	B14137-7 @ 15'	B14137-5 @ 5'	B14137-5 @ 10'	B14137-5 @ 15'	MW14137-5 @ 5'	MW14137-5 @ 10'	MW14137-5 @ 15'	B14137-6 @ 5'	B14137-6 @ 10'	B14137-6 @ 15'	MW14137-6 @ 5'	MW14137-6 @ 10'	MW14137-4A @ 10'	MW14137-4A @ 15'	MW14137-4A @ 20'	
Date Collected				11/4/98	11/4/98	11/4/98	11/5/98	11/5/98	11/5/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	11/4/98	3/11/00	3/11/00	3/11/00
Stationary Laboratory Results - SPLP PAHs																								
Dilution Factor				101																				
Acenaphthene	8310	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <50	ND <5	--
Acenaphthylene	8310	mg/L	2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <20	ND <2	--
Anthracene	8310	mg/L	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.4J	ND <0.2	--
Benz[a]anthracene	8310	mg/L	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3	ND <0.2	--
Benzo[a]pyrene	8310	mg/L	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <2	ND <0.2	--
Benzo[b]fluoranthene	8310	mg/L	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <2	ND <0.2	--
Benzo[g,h,i]perylene	8310	mg/L	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <2	ND <0.2	--
Benzo[k]flouranthene	8310	mg/L	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <2	ND <0.2	--
Chrysene	8310	mg/L	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.8J	ND <0.2	--
Dibenz[a,h]anthracene	8310	mg/L	0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <5	ND <0.5	--
Flouranthene	8310	mg/L	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <2	ND <0.2	--
Flourene	8310	mg/L	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <10	ND <1	--
Indeno[1,2,3-cd]pyrene	8310	mg/L	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <2	ND <0.2	--
Naphthalene	8310	mg/L	5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <50	ND <5	--
Phenanthrene	8310	mg/L	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	23	ND <1	--
Pyrene	8310	mg/L	0.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND <2	ND <0.2	--
Stationary Laboratory Results - Physical/Chemical/Biological/Indicators																								
Heterotrophic Plate Count	SM9215	cfu/10g	1	1,800	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Hydrocarbon Degradar	SM9215A	MPN/g		23	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Moisture (Percent in Soil)	ASTM-D2216	%Moisture	0.5	8.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
pH	9045	pH unit	0.01	7.66	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Ammonia (NH4)	350.2	mg/kg	5	39	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nitrate (NO3) as N	SM4500NO3D	mg/kg	5	4J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Eh	ASTM1498	mV	1	336 ^(c)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Orthophosphate	365.2	mg/kg	0.2	119	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Sulfate SO4	375.4	mg/kg	10	6.0J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Iron, Fe	6010	mg/kg	3	14,800	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Manganese, Mn	6010	mg/kg	0.5	223	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Notes:

-- - Not analyzed

µg/kg - micrograms per kilogram

(a) - Not a typical gas pattern. Most of the peaks in the chromatogram correspond to the heavier portion of the chain.

(b) - Diesel range organics not identified as diesel

ASTM - American Society for Testing and Materials

BTEX - benzene,toluene, ethylbenzene, total xylenes

CA DHS - California Department of Health Services

cfu/g - colony forming units per gram

J - reported between PQL and MDL

MCB - Marine Corps Base

MDL - Method Detection Limit

mg/kg - milligrams per kilogram

mg/L - milligrams per liter

MTBE - methyl ter-butyl ether

mV - millivolts

ND - Not found above the detection limit

PAH - polynuclear aromatic hydrocarbon

PQL - Practical Quantitation Limit

SPLP - Synthetic Precipitation Leachate Procedure

TPH-d - total petroleum hydrocarbons quantified as diesel

TPH-g - total petroleum hydrocarbons quantified as gasoline

UST - Underground Storage Tank

TABLE 2-3

SUMMARY OF HISTORICAL GROUNDWATER SAMPLING RESULTS,
UST SITE 14137, MCB CAMP PENDLETON, CALIFORNIA

Well ID	Date Sampled	Sample ID	TPH-d (mg/L)	TPH-g (mg/L)	TPH-mo (mg/L)	Detected VOCs (µg/L)																				Detected PAHs (µg/L)	
						Benzene	Toluene	Ethylbenzene	Xylenes (total)	MTBE	Acetone	Bromodichloromethane	Chloroform	Chlorodibromomethane	Dibromodichloromethane	Isopropylbenzene	N-Butylbenzene	sec-Butylbenzene	Isopropylbenzene	Naphthalene	Tetrachloroethene	Trichloroethene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Naphthalene	Pyrene	
1998 Site Investigation																											
MW1	Not sampled		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW2	Not sampled		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW3	Not sampled		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
MW4	12/01/98	MW4	10	0.63 ^(a)	ND <5	7 J	2 J	8 J	20	431	130 J	ND <10	ND <10	ND <10	--	2 J	3 J	0.8 J	2 J	20	3 J	5 J	10	5 J	9	0.5	
MW5	12/01/98	MW5	ND <0.5	--	ND <0.5	ND <5	ND <5	ND <5	ND <5	4 J	9 J	ND <5	0.6 J	ND <5	--	ND <5	ND <5	ND <5	ND <5	ND <5	ND <5	2 J	ND <5	ND <5	ND <5	ND <5	ND <0.2
MW6	12/01/98	MW6	ND <0.5	--	ND <0.5	ND <5	ND <5	ND <5	ND <5	ND <10	ND <100	0.9 J	1 J	0.5 J	--	ND <5	ND <5	ND <5	ND <5	ND <5	ND <5	4 J	ND <5	ND <5	ND <5	ND <5	ND <0.2
March 2006 Groundwater Sampling Event																											
MW1	03/14/06	0004-120	ND	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW2	03/14/06	0004-121	2.2	--	--	ND	ND	ND	ND	9.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW3	03/14/06	0004-123	ND	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW4	--	--	Well abandoned																								
MW5	03/14/06	0004-122	ND	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW6	03/14/06	0004-119	ND	--	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW7	03/14/06	0004-124	0.25	--	--	ND	ND	ND	ND	0.41 J	ND	0.3 J	ND	ND	0.32 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		0004-125 (Dup)	0.26	--	--	ND	ND	ND	ND	0.44 J	ND	0.31 J	ND	ND	0.33 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

^(a) - Not a typical gas pattern. Most peaks on chromatogram correspond to heavier portion of carbon chain.

-- - not analyzed

µg/L - micrograms per liter

Dup - duplicate sample

J - estimated value

MCB - Marine Corps Base

mg/L - milligrams per liter

MTBE - methyl tert-butyl ether

ND - not detected above project reporting limits

PAH - polynuclear aromatic hydrocarbon

TPH-d - total petroleum hydrocarbons quantified as diesel

TPH-g - total petroleum hydrocarbons quantified as gasoline

TPH-mo - total petroleum hydrocarbons quantified as motor oil

UST - Underground Storage Tank

VOC - volatile organic compound

TABLE 2-4

**SUMMARY OF SOIL EXCAVATION CONFIRMATION SAMPLE RESULTS,
UST SITE 14137, MCB CAMP PENDLETON, CALIFORNIA**

Sample Number	Date Sampled	Location	Depth	TPH-d (mg/kg)	SPLP/TPH-d (mg/L)	Detected SPLP/VOCs (µg/L)	Detected SPLP/PAHs (µg/L)	Total Aerobic Heterotrophic Bacteria (cfu/g)	Total Diesel Oxidizing Bacteria (cfu/g)
0004-073	2/3/06	East sidewall	10	ND	--	--	--	--	--
0004-074	2/3/06	West Sidewall (shallow)	4	780	--	--	--	--	--
0004-075	2/3/06	West sidewall (deep)	13	1,600	5	Ethylbenzene 0.51 Xylenes 0.83J	Acenaphthene 1.3 Fluorene 4 Naphthalene 7.7 Phenanthrene 6.2	2.50E+03	1.66E+03
0004-076	2/3/06	North sidewall	10	53	--	--	--	--	--
0004-077	2/3/06	South sidewall (shallow)	4	ND	--	--	--	--	--
0004-078	2/3/06	South sidewall (deep)	12	6,700	30	Ethylbenzene 5.3 Xylenes 6.8 Toluene 0.65	Acenaphthene 6.3J Fluorene 23 Naphthalene 65 Phenanthrene 43 Pyrene 2.2J	--	--
0004-079	2/3/06	South sidewall (dup) (deep)	12	6,200	34	Ethylbenzene 4.8 Xylenes 7.9 Toluene 0.63	Acenaphthene 4.9J Fluorene 16J Naphthalene 54 Phenanthrene 25	--	--
0004-080	2/3/06	Excavation bottom (north side)	17	ND	--	--	--	--	--
0004-081	2/3/06	Excavation bottom (south side)	17	14	--	--	--	--	--

Notes:

-- - not analyzed

µg/L - micrograms per liter

cfu/g - colony forming units per gram

dup - field duplicate sample

J - estimated value; value falls between the method detection limit and the project reporting limit

MCB - Marine Corps Base

mg/kg - milligrams per kilogram

mg/L - milligrams per liter

ND - not detected above laboratory reporting limits

PAH - polynuclear aromatic hydrocarbon

SPLP - Synthetic Precipitation Leaching Procedure

TPH-d - total petroleum hydrocarbons quantified as diesel

VOC - volatile organic compound

UST - Underground Storage Tank

TABLE 2-5

**SUMMARY OF EXCAVATION FILL MATERIAL SAMPLE RESULTS,
UST SITE 14137, MCB CAMP PENDLETON, CALIFORNRNIA**

Sample ID	Date Sampled	TPH-d	Title 22 Metals																	Asbestos	pH
			Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Molybdenum	Mercury	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc		
			mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		
0004-070	1/12/2006	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	--
0004-071	1/12/2006	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	ND	--
0004-072	1/17/2006	ND	ND	2.07	92.2	0.402J	0.225J	23.5	5.78	17.7	7.39	1.15J	ND	16.1	0.784J	0.624J	7.23	33.1	49.2	--	8.11
EPA Residential PRGs		N/A	31	0.0062	5400	150	37	30	900	3,100	150	390	23	160	390	390	5.2	78	23,000	--	--

Notes:

-- - not analyzed

N/A - not applicable

EPA - U.S. Environmental Protection Agency

J - estimated value; value falls between the method detection limit and the project reporting limit

MCB - Marine Corps Base

mg/kg - milligrams per kilogram

ND - not detected above laboratory reporting limits

PRG - Preliminary Remediation Goal

TPH-d - total petroleum hydrocarbons quantified as diesel

UST - Underground Storage Tank

TABLE 2-6

**SUMMARY OF HISTORICAL GROUNDWATER ELEVATIONS,
UST SITE 14137, MCB CAMP PENDLETON, CALIFORNIA**

Monitoring Well ID	Well Screen Interval (feet btoc)	Reference Point (toc) Elevation (feet amsl)	Date Measured	Depth to Water (feet btoc)	Groundwater Elevation (feet amsl)
MW1	10 - 20 ⁽¹⁾	284.56	12/1/1998	6.19	278.37
			3/14/2006	6.84	277.72
MW2	10 - 20 ⁽¹⁾	284.02	12/1/1998	6.74	277.28
			3/14/2006	7.29	276.73
MW3	39,010.00	282.76	12/1/1998	7.38	275.38
			3/14/2006	7.66	275.10
MW5	5 - 15	282.04	12/1/1998	34.97	247.07
			3/14/2006	7.70	274.34
MW6	5 - 15	284.89	12/1/1998	6.58	278.31
			3/14/2006	6.74	278.15
MW7	5 - 15	283.13	Not installed	--	--
			3/14/2006	7.82	275.31

Notes:

(1) assumed similar depths to MW3

amsl - above mean sea level

btoc - below top of casing

MCB - Marine Corps Base

N/A - not available

toc - top of casing

UST - Underground Storage Tank

TABLE 4-1

**PROPOSED CLEANUP OBJECTIVES FOR CONTAMINANTS,
UST SITE 14137, MCB CAMP PENDLETON, CALIFORNIA**

Constituent	Groundwater	Soil
TPH-d	100 µg/L ^(a)	SPLP<Groundwater Objective
Benzene	1.0 µg/L ^(b)	SPLP<Groundwater Objective
Toluene	150 µg/L ^(b)	SPLP<Groundwater Objective
Ethylbenzene	680 µg/L ^(b)	SPLP<Groundwater Objective
Total Xylenes	1,750 µg/L ^(b)	SPLP<Groundwater Objective
Benzo[a]pyrene	0.2 µg/L ^(b)	SPLP<Groundwater Objective
Phenanthrene	1.0 µg/L ^(b)	SPLP<Groundwater Objective

Notes:^(a) Secondary taste and odor threshold^(b) Maximum Contaminant Levels

µg/L – micrograms per liter

MCB – Marine Corps Base

SPLP – Synthetic Precipitation Leaching Procedure

TPH-d – total petroleum hydrocarbons quantified as diesel

UST – Underground Storage Tank

TABLE 5-1

**SUMMARY OF SCREENING OF REMEDIAL TECHNOLOGIES FOR SOIL,
UST SITE 14137, MCB CAMP PENDLETON, CALIFORNIA**

General Response Actions	Remedial Technologies	Process Options	Effectiveness	Implementability	Cost	Comments
Active Remediation	<i>In situ</i> biological treatment.	Bioventing/ Biosparging: Introduce oxygen into the impacted soils in both the vadose zone and saturated zone (most of the remaining contamination is below groundwater) to increase the biological activity of native microorganisms.	Moderate: Oxygen is typically the limiting factor for aerobic bioremediation, and adding oxygen has been shown to be effective to reduce concentrations of petroleum contaminants adsorbed to soil particles both above and below the water table. However, during groundwater sampling and soil excavation activities, groundwater recharge was very slow, suggesting that soil permeabilities are low, which will inhibit the effectiveness of bioventing/biosparging.	Moderate: Bioventing/biosparging are conventional, well-known technologies. However, bioventing/biosparging in soils with low permeabilities would potentially require numerous injection wells on a tight grid pattern.	Moderate: Depends on the number of injection wells required and the length of time it would take for contaminant levels to drop in the low-permeability soil. It is conservatively assumed that 5+ years of bioventing/biosparging may be required.	Eliminated: Even though bioventing/biosparging is an effective <i>in situ</i> remedial alternative, it is eliminated due to the relatively low volume of hydrocarbon contamination left (estimated 50 cubic yards) and the low-permeability soils. With the low-permeability soils, implementing bioventing/biosparging will likely be difficult, and may not be very effective.
Active Remediation	Removal.	Excavation/Disposal: Excavation with off-site disposal of remaining impacted soils in both the vadose zone and the saturated zone.	High: Provides long-term effectiveness and permanence. Provides protection of human health and the environment by reducing or eliminating the volume of contaminated soils.	Difficult: Excavation is a conventional and well-established technology; however, the remaining impacted soils are located beneath and Building 14137. Extensive shoring and building support would be required.	High: An extensive effort would be required to excavate contaminated soil below groundwater beneath Building 14137. Extensive shoring and building support would be required.	Retained: Even though excavation would be difficult and expensive to implement, it is considered the best active remedial alternative available for the site.

TABLE 5-1

**SUMMARY OF SCREENING OF REMEDIAL TECHNOLOGIES FOR SOIL,
UST SITE 14137, MCB CAMP PENDLETON, CALIFORNIA**

General Response Actions	Remedial Technologies	Process Options	Effectiveness	Implementability	Cost	Comments
Active Remediation	<i>In situ</i> chemical treatment.	Chemical oxidation: Introduce a chemical oxidant to either destroy or degrade contaminants.	High: Where implementable, this technology has been shown to remediate hydrocarbons in soil in both the vadose zone and the saturated zone. The oxidants used are readily available and treatment time is usually measured in months, as opposed to years.	Difficult: Based on the presence of low-permeability soils, which will inhibit the oxidants to readily infiltrate the formation. A pilot test would be recommended. In addition, this technology is not commonly recommended for impacted soils near buildings due to potential exothermic reactions.	Moderately high: Potentially extensive drilling because of low-permeability soils and extensive monitoring activities because of Building 14137 would increase costs.	Eliminated: Based on the low-permeability soils, this technology may be difficult to implement or potentially not implementable at all. The low-permeability soils and adjacent Building 14137 are not well-suited for <i>in situ</i> chemical oxidation.

TABLE 5-1

**SUMMARY OF SCREENING OF REMEDIAL TECHNOLOGIES FOR SOIL,
UST SITE 14137, MCB CAMP PENDLETON, CALIFORNIA**

General Response Actions	Remedial Technologies	Process Options	Effectiveness	Implementability	Cost	Comments
No Further Action	Not applicable.	Not applicable.	<p>High:</p> <p>Natural attenuation has been shown to be effective at petroleum sites for the long-term, permanent removal of hydrocarbon contaminants. Impacted soils both above and below groundwater were removed to the extent practical, and an estimated 50 cubic yards of hydrocarbon-impacted soil remain on site. Since data indicate that total aerobic heterotrophic bacteria and total diesel-oxidizing bacteria are naturally present in soil at levels above those considered optimal (EPA, 1995), it is believed natural attenuation will occur at the site.</p>	<p>Easy:</p> <p>No additional soil remedial activities would be performed.</p>	<p>Low:</p> <p>Since there would be no additional soil remediation, there would be no additional soil remediation costs. The only cost would be associated with abandoning the groundwater monitoring wells after regulatory site closure.</p>	<p>Retained:</p> <p>It is believed that the relatively low volume (50 cubic yards) of remaining petroleum-impacted soils (in both the vadose zone and the saturated zone) will attenuate naturally, especially since total aerobic heterotrophic bacteria and total diesel-oxidizing bacteria are naturally present at the site at levels above those considered optimal (EPA, 1995).</p>

Notes:

EPA – U.S. Environmental Protection Agency

MCB – Marine Corps Base

UST – Underground Storage Tank

TABLE 5-2

**SUMMARY OF SCREENING OF REMEDIAL TECHNOLOGIES FOR GROUNDWATER,
UST SITE 14137, MCB CAMP PENDLETON, CALIFORNIA**

General Response Actions	Remedial Technologies	Process Options	Effectiveness	Implementability	Cost	Comments
No Further Action	Not applicable.	Not applicable.	High: Hydrocarbon constituents are readily biodegradable and the nearest municipal supply well is 1.5 miles away. Analytical data indicate that hydrocarbon-degrading bacteria are present in aquifer soils at levels above those considered optimal by the EPA.	Easy: No remedial activities would be performed. Site closure would be complete after the destruction of the existing groundwater monitoring wells.	Low: Costs to destroy existing wells would be relatively low.	Retained: Assumes site closure would be considered appropriate under existing conditions.
Limited Action	Remediation by monitored natural attenuation.	Groundwater monitoring: Groundwater monitoring program to verify that contaminant levels are stable or decreasing.	High: Hydrocarbon constituents are readily biodegradable, and the nearest municipal supply well is 1.5 miles away. Analytical data indicate that hydrocarbon-degrading bacteria are present in aquifer soils at levels above those considered optimal by the EPA.	Moderately easy: Consists of periodic groundwater monitoring to assess contaminant disappearance.	Moderate: It is assumed that a 1-year quarterly monitoring program would be sufficient to evaluate seasonal changes and develop a high degree of confidence in the sampling data.	Retained: Relatively easy to implement.

TABLE 5-2

**SUMMARY OF SCREENING OF REMEDIAL TECHNOLOGIES FOR GROUNDWATER,
UST SITE 14137, MCB CAMP PENDLETON, CALIFORNIA**

General Response Actions	Remedial Technologies	Process Options	Effectiveness	Implementability	Cost	Comments
Active Remediation	<i>In situ</i> biological treatment.	Biosparging: Introduce oxygen into the saturated zone by pumping air into the subsurface.	Moderate: Oxygen is typically the limiting factor for aerobic bioremediation, and adding oxygen has been shown to be effective to reduce concentrations of petroleum contaminants below the water table. However, during groundwater sampling and soil excavation activities, groundwater recharge was slow, indicating that soil permeabilities are low, which will inhibit the effectiveness of biosparging.	Moderate: Biosparging is a conventional, well-known technology. However, biosparging in soils with low permeabilities would potentially require numerous injection wells on a tight grid pattern.	Moderate: Depends on the number of injection wells required and the length of time it would take for contaminant levels to drop in the low-permeability soil. It is conservatively assumed that several years of biosparging may be required.	Eliminated: Even though biosparging is an effective <i>in situ</i> remedial alternative, it is eliminated due to the relatively low levels of hydrocarbon contamination left in groundwater and the low-permeability aquifer. With the low-permeability soils, implementing biosparging will likely be difficult.
Active Remediation	<i>In situ</i> biological treatment.	Addition of ORC to the contaminated zone: ORC is a patented formulation of magnesium peroxide that produces a slow, sustained source of oxygen in groundwater, which enhances the ability of indigenous microorganisms to degrade fuel hydrocarbons.	High: Oxygen is typically the limiting factor for aerobic bioremediation, and adding oxygen has been shown to be effective at similar sites. Contrary to biosparging, which relies on pressure to push air into the groundwater, ORC provides high concentrations of molecular oxygen that migrate into the contaminated aquifer via diffusion, and thus is not as restricted by low-permeability soils as biosparging.	Moderate: ORC is applied to the subsurface via push-point injection.	Moderately high: Costs include purchasing ORC and applying it to the subsurface, with periodic groundwater monitoring. Multiple injections would likely be required.	Eliminated: The effort and costs are not justified based on the low-permeability soils and the low potential for adverse impacts from the site to sensitive receptors or nearby water resources (refer to Section 3.3).

TABLE 5-2

**SUMMARY OF SCREENING OF REMEDIAL TECHNOLOGIES FOR GROUNDWATER,
UST SITE 14137, MCB CAMP PENDLETON, CALIFORNIA**

General Response Actions	Remedial Technologies	Process Options	Effectiveness	Implementability	Cost	Comments
Active Remediation	<i>In situ</i> chemical treatment.	Chemical oxidation: Introduce a chemical oxidant into the saturated zone either to destroy or degrade contaminants.	Moderate to high: Technology has been shown to remediate hydrocarbons in groundwater. The oxidants used are readily available, and treatment time is usually measured in months as opposed to years.	Difficult: Impacted saturated soils have low permeability. Also, this technology is not recommended near buildings due to potential exothermic reactions.	Moderate to high: Potentially extensive drilling (due to low permeability soils) and monitoring activities would increase costs.	Eliminated: The effort and costs are not justified based on the low-permeability soils and the low potential for adverse impacts from the site to sensitive receptors or nearby water resources (refer to Section 3.3).
Active Remediation	<i>Ex situ</i> pump and treat.	Groundwater Extraction: Groundwater extraction coupled with adsorption/destruction processes such as air stripping, or granular activated carbon and reintroduction of treated water back into the aquifer.	Low: Readily capable of removing contaminants from extracted water. However, hydrocarbon compounds typically adsorb strongly to soil particles, necessitating system operation over an extensive period of time, and disproportionately large groundwater extraction volumes.	Moderate: <i>Ex situ</i> pump and treat is a conventional and established technology; however, an extended period of extraction would likely be required based on the low permeability of the aquifer material.	Very high: High capital and O&M costs. Involves system operation over a potentially long period of time, transport of waste off site, and associated permitting.	Eliminated: Low effectiveness and very high cost eliminate pump and treat as a feasible option.

Notes:

EPA – U.S. Environmental Protection Agency

MCB – Marine Corps Base

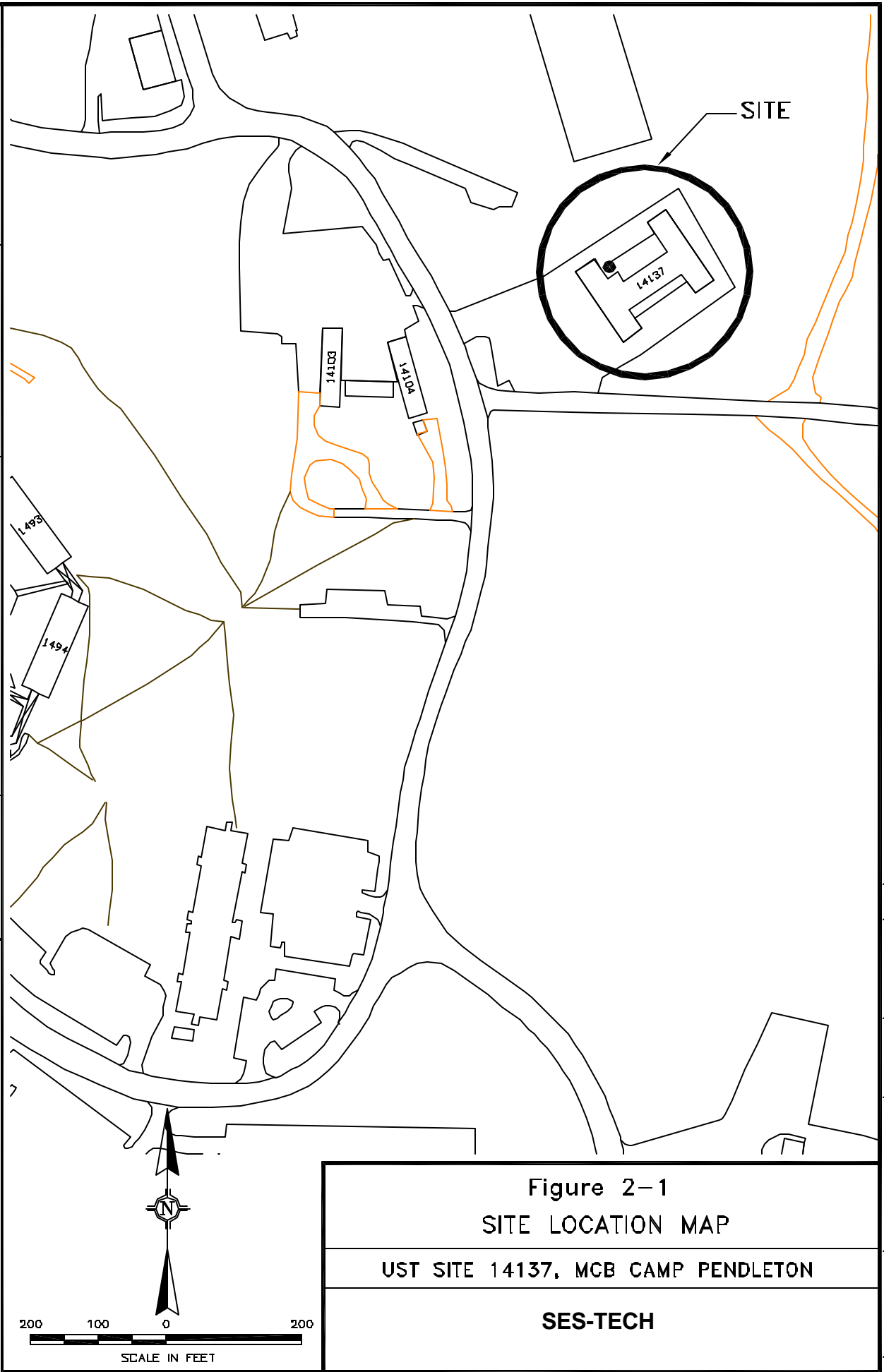
O&M – operation and maintenance

ORC – Oxygen Release Compound

UST – Underground Storage Tank

FIGURES

DRAWN BY: MD	CHECKED BY: JS	APPROVED BY: MC	DCN: SES-TECH-06-0060	DRAWING NO:
DATE: 06/09/06	REV: REVISION 0		CTO: #0004	06006021.DWG



P:\2973-SESTECH\CTO-0004-PENDLETON\SITE 14137\06-0060 CAP\DWG\06006021.DWG
PLOT/UPDATE: JUN 08 2006 14:54:35

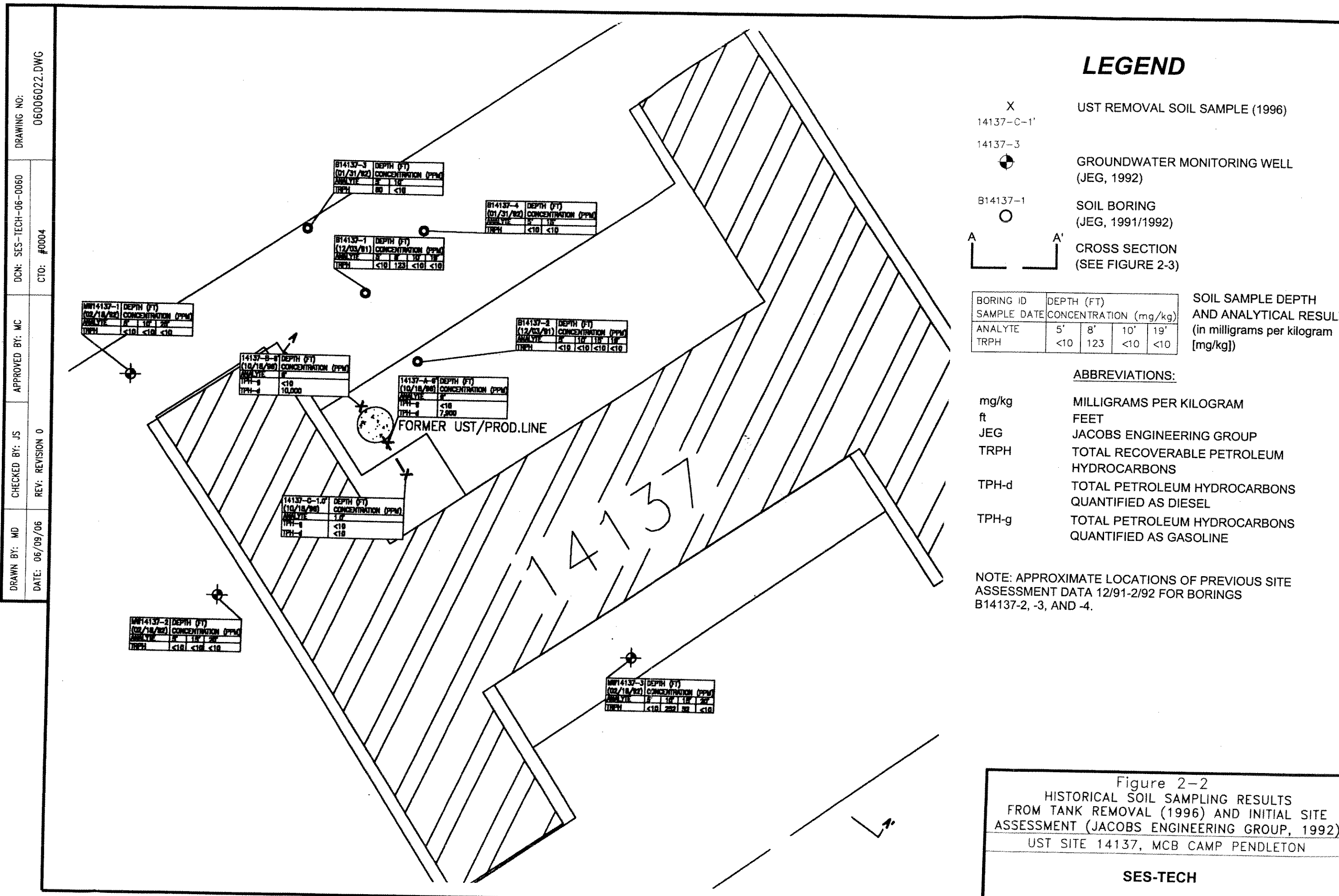
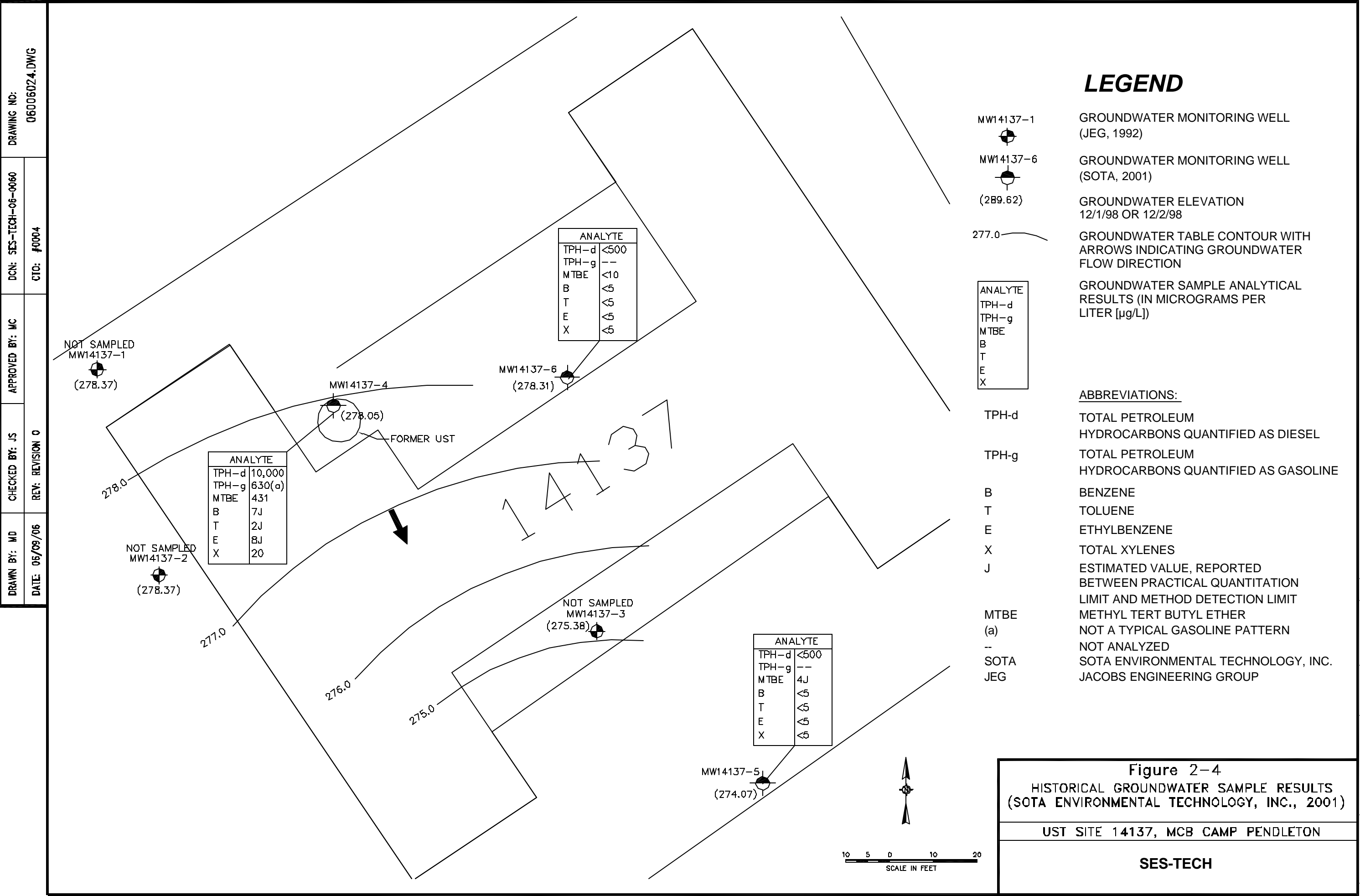
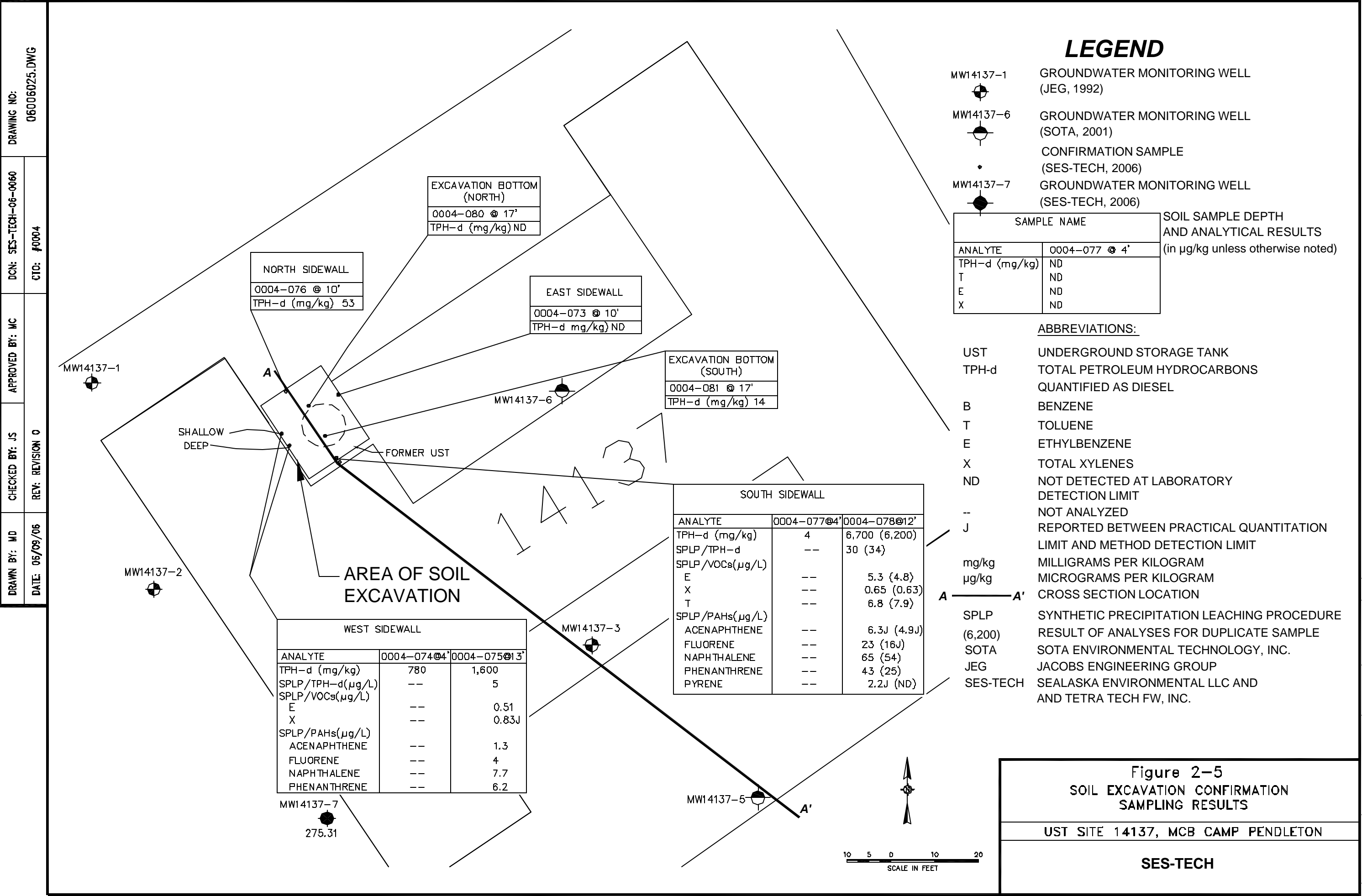


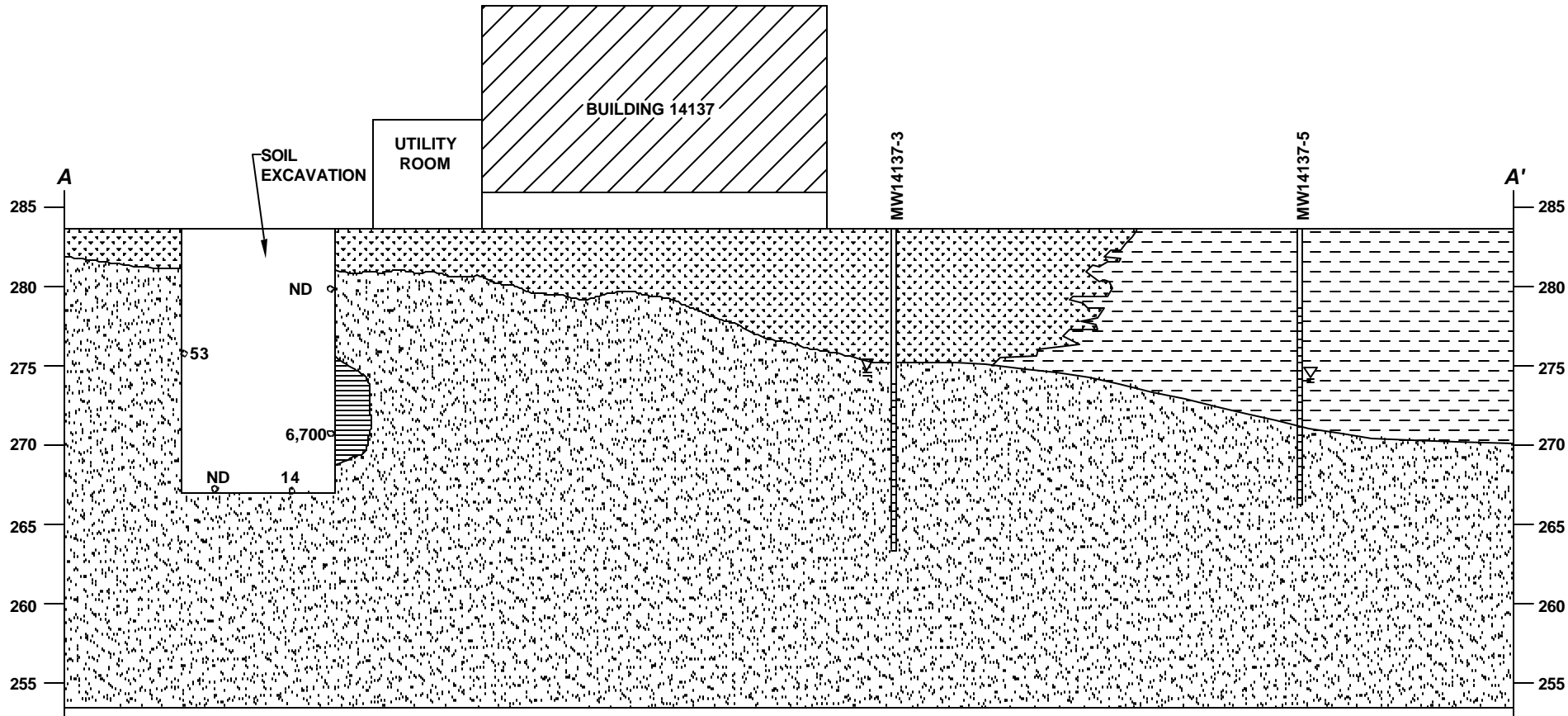
Figure 2-2
HISTORICAL SOIL SAMPLING RESULTS
FROM TANK REMOVAL (1996) AND INITIAL SITE
ASSESSMENT (JACOBS ENGINEERING GROUP, 1992)
UST SITE 14137, MCB CAMP PENDLETON

SES-TECH





DRAWING NO: 06006026.DWG		DCN: SES-TECH-06-0060		CTD: #0004	
DRAWN BY: MD		CHECKED BY: JS		REV: REVISION 0	
DATE: 06/09/06		APPROVED BY: MC			



MONITORING WELL ID

EXCAVATION SOIL CONFIRMATION
SAMPLE WITH TPH-d RESULT (mg/kg)

WELL WITH
SCREEN INTERVAL

LITHOLOGIC CONTACTS

SILTY SAND, SAND
SILT-MIXTURES

POORLY GRADED
SAND

BEDROCK
(GRANITIC ROCK)

APPROXIMATE EXTENT OF TPH-d
IMPACTED SOIL > THAN 100 mg/kg

LIMITS OF SOIL EXCAVATION

ND

NOT DETECTED AT
LABORATORY DETECTION
LIMIT

mg/kg

MILLIGRAMS PER KILOGRAM

WATER LEVEL

TPH-d

TOTAL PETROLEUM HYDROCARBONS
QUANTIFIED AS DIESEL

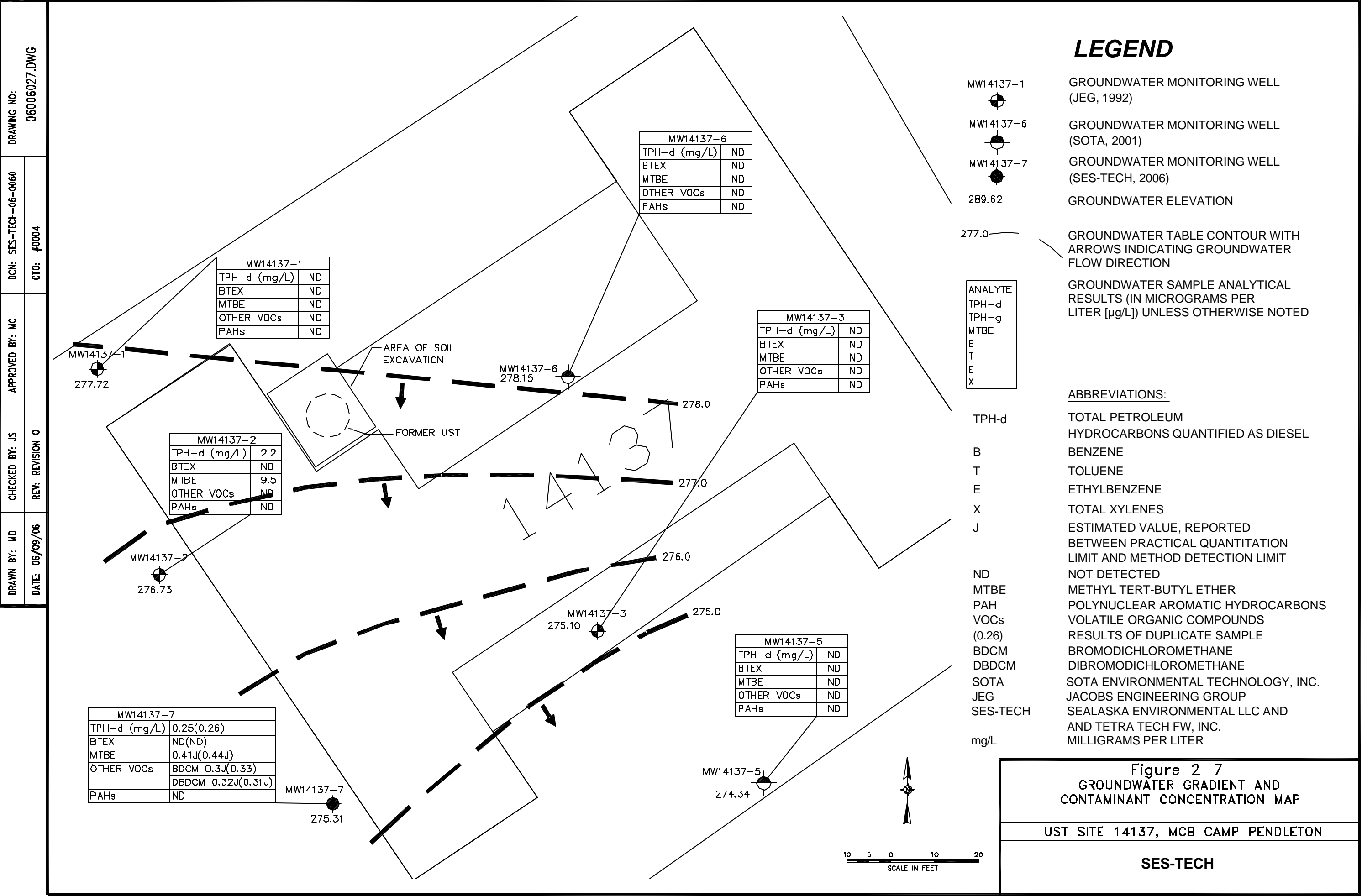


Figure 2-6

CROSS SECTION A-A'

UST SITE 14137, MCB CAMP PENDLETON

SES-TECH



APPENDIX A

WELL PERMIT DOCUMENTATION



TETRA TECH EC, INC.

April 27, 2006

Monitoring Well Permit Clerk
Site Assessment and Mitigation Program
County of San Diego, Department of Environmental Health
P.O. Box 129261
San Diego, CA 92112-9261

Subject: Monitoring Well Destruction and Installation Notification, UST Sites 14131, 14137, Marine Corps Base (MCB) Camp Pendleton, California

Reference: Permit No. LMON 103667

Well Permit Clerk:

Per your request, Tetra Tech EC is submitting the attached document in fulfillment of the conditions of monitoring well installation permit number LMON 103667. Documentation of the well destruction was previously submitted. The permit was issued on January 6, 2006, and the County was given 48 hours notice prior to commencement of the work of each phase of work. The work was conducted for the following UST Sites:

Property Owner: United States Marine Corps

Site Address: UST Sites 14131, 14137
14 Area, MCB Camp Pendleton, California 92055

Contact Person: Mr. Chet Storrs
RCRA Division Head

On February 21, 2006, 2 groundwater monitoring wells were installed in the 14 area of MCB Camp Pendleton; one at site 14131, and one at adjacent site 14137. The following volumes and materials were used in the construction of each of the wells:

Boring/ Well	Filter Pack #2/16 sand (cubic feet)	Transition Seal Bentonite chips (cubic feet)	Concrete Completion (cubic feet)
14131-MW7	3	1	1
14137-MW7	3	1	1



1940 E. Deere Avenue, Suite 200, Santa Ana, CA 92705
Tel: 949.756.7500 Fax: 949.756.7560
www.ttedi.com

The attached documents include boring/monitoring well logs with well completion information, a signed and stamped Registered Geologist certification letter for the boring/monitoring well logs, and a well location map.

In addition, unfortunately the four (4) well installations at UST Site 1441 included on the permit have been postponed. A request for permit extension for these wells will soon follow.

If you have any questions regarding this matter, please contact the undersigned.

Sincerely,
Tetra Tech EC



Mark Cutler, RG
Senior Supervising Geologist

Attachments:
Copy of Permit
Location Map
Registered Geologist Certification Letter
Boring Logs



PERMIT #LMON103667
A.P.N. #101-520-14-00
EST #H05939-266/267/306

**COUNTY OF SAN DIEGO
DEPARTMENT OF ENVIRONMENTAL HEALTH
LAND AND WATER QUALITY DIVISION
MONITORING WELL PROGRAM**

MONITORING WELL AND BORING CONSTRUCTION AND DESTRUCTION PERMIT

SITE NAME: BUILDINGS 14137 14131, 1441

SITE ADDRESS: AREA 14, MARINE CORPS BASE, CAMP PENDLETON

PERMIT TO: **INSTALL 6 & DESTROY 5 GROUNDWATER MONITORING WELLS**

PERMIT APPROVAL DATE: JANUARY 6, 2006

PERMIT EXPIRES ON: MAY 6, 2006

RESPONSIBLE PARTY: U.S. MARINE CORPS, CAMP PENDLETON

PERMIT CONDITIONS:

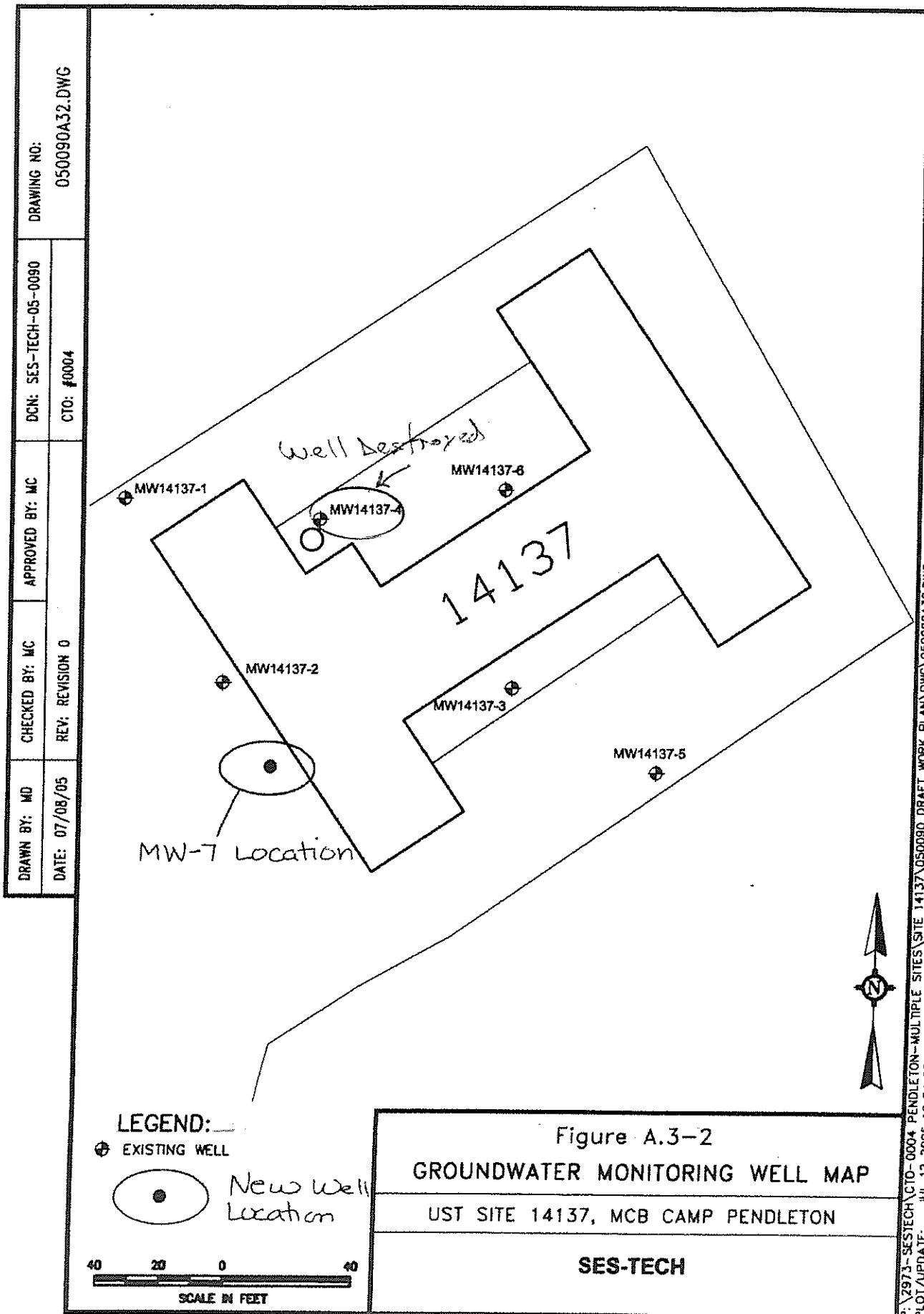
1. Each of the monitoring wells must be constructed with a minimum annular seal of 5 feet and a maximum screened interval of 15 feet.
2. Contact the Regional Water Quality Control Board for their comments and concerns prior to commencing field activities.
3. Wells must have a minimum 3-foot concrete surface seal. The surface seal shall consist of concrete able to withstand the maximum anticipated load without cracking or deteriorating. The concrete should meet Class A specifications of a minimum 4000-pound compressive strength.
4. For the well destructions, all material within the original borehole, which includes the casing, filterpack and annular seal, must be removed. The borehole must be completely filled with an approved sealing material as specified in Department of Water Resources Bulletin 74-90.
5. All water and soil resulting from the activities covered by this permit must be managed, stored and disposed of as specified in the SAM Manual in Section 5, II. E- 4. (http://www.sdcountry.ca.gov/deh/lwq/sam/manual_guidelines.html). In addition, drill cuttings must be properly handled and disposed in compliance with the Stormwater Best Management Practices of the local jurisdiction.
6. Within 60 days of completing work, submit a well construction report, including all well and/or boring logs and laboratory data to the Well Permit Desk. This report must include all items required by the SAM Manual, Section 5, Pages 6 & 7.
7. This office must be given 48-hour notice of any drilling activity on this site and advanced notification of drilling cancellation. Please contact the Well Permit Desk at 338-2339.

APPROVED BY: _____

KEVIN HEATON

DATE: 01/06/2006

NOTIFIED: by email 1/6/06 msc
DEH: SAM-9075 (3/05)

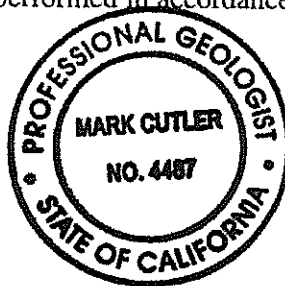


WELL INSTALLATION

Statement of Certification

I, Mark Cutler, certify that, to the best of my knowledge, the data and information presented in the boring and well completion logs listed below are accurate and complete. Field activities and documentation were performed in accordance with accepted practices and procedures.


Mark Cutler, CA PG # 4487



PERMIT NO. LMON 103667

MCB Camp Pendleton, Area 14, UST Site 14131

- Monitoring Well MW-7

MCB Camp Pendleton, Area 14, UST Site 14137

- Monitoring Well MW-7

TETRA TECH EC, INC.

LOG OF BORING MW-7 (Sheet 1 of 1)

Client: NAVFAC SW

Drilling Company: West Hazmat

Project: UST Site 14137

Drilling Method: Hollow-Stem Auger

Project Number: 2973.0004

Sampling Method: Split-Spoon

Location: Marine Corps Base Camp Pendleton

Borehole Diameter: 8 in.

Geologist: J. Sager

Northing: 2,059,646.93 Feet (NAD 83)

Date Started: February 21, 2006

Easting: 6,240,721.53 Feet (NAD 83)

Date Completed: February 21, 2006

Ground Surface Elevation: 283.50 Feet AMSL (NAVD 88)

Total Depth: 15.0 Feet bgs

Top of Casing Elevation: 283.13 Feet AMSL (NAVD 88)

Depth (ft. bgs)	Well/Boring Completion	Well/Boring Remarks	Blow Counts	Samples	Sample Number	PID Readings PPM	USCS	Graphic Log	LITHOLOGIC DESCRIPTION	Elevation (ft.)
0		Flushed Mounted Well Vault				0.4	SM		0 to 4.5 ft. SILTY SAND - 85% fine to coarse grained sand, subrounded to subangular, 15% non-plastic fines, moist, brown, very loose, no hydrocarbon odor or staining	280
5		Cement								
		Bentonite Seal								
		4" Schedule 40 PVC Riser								
		4" Schedule 40 PVC Factory-Slotted Screen 0.010" Slot-Size				0.4			4.5 to 15 ft. GRANITE - weathered (decomposed) granitic rock (igneous), medium hard/dense, light brown, moist, no odor or staining	275
10						0.5				270
15		Filter Pack #2/16 Sand				0.5				265

Notes: Reviewed By: M. Cutler, P.G. 4/26/06

AMSL = above mean sea level

bgs = below ground surface

NA = not applicable

PVC = Polyvinyl Chloride

PVC = polyvinyl chloride





TETRA TECH EC, INC.

February 10, 2006

Monitoring Well Permit Clerk
Site Assessment and Mitigation Program
County of San Diego, Department of Environmental Health
P.O. Box 129261
San Diego, CA 92112-9261

Subject: **Well Destruction Permit Protocol**
UST Sites 14137, 14131, and 1441, MCB Camp Pendleton

Reference: Permit Number LMON103667, January 6, 2006

Well Permit Clerk:

Tetra Tech EC is submitting this letter in fulfillment of the conditions of boring permit number LMON 103667 issued on January 6, 2006, for work at the following project:

Property Owner: United States Marine Corps
Site Address: Building 22165, MCB Camp Pendleton, California 92055
Contact Person: Mr. Chet Storrs
Assistant Chief of Staff, Environmental Security

On January 27 & 30, 2006, Tetra Tech EC observed the destruction of five 4-inch diameter groundwater monitoring wells, one at Site 14137, one at Site 14131, and three at Site 1441 (A.P.N. #101-520-14-00). The following is a summary of work conducted, including a description of the destruction method, and the type and volume of backfill materials used.

At each of the five wells, the well box was removed before overdrilling began. An 8-inch hollow stem auger was then used to drill the entire depth of each well, with the cuttings being drummed and sent off-site for disposal. Once the wells were overdrilled, the well casings were removed and backfilling began. The approximate volumes of each borehole and the backfill material (in cubic feet) are as follows:

Site 14137

MW4:

Volume of borehole to 20 feet: 6.9 cubic feet (ft³)

Volume of backfill: 6 ft³ bentonite grout + 1 ft³ hydrated bentonite chips on top = 7 ft³ backfill





TETRA TECH EC, INC.

Site 14131

MW4

Volume of borehole to 15 feet: 5.2 ft³

Volume of backfill: 4.5 ft³ bentonite grout + 1 ft³ hydrated bentonite chips on top = 5.5 ft³ backfill

Site 1441

During the destruction of the wells at Site 1441, very difficult drilling conditions were encountered. The predominant lithology at the site consists of decomposed granite (bedrock). Due to these conditions, the original boreholes were installed using an air-rotary drilling method, and while attempting to overdrill using a hollow-stem auger rig with an 8-inch auger, refusal was met at an approximate depth of 10 feet. The boreholes were therefore overdrilled to depth using a 6-inch auger.

MW1:

Volume of borehole to 38 feet: 8.9 ft³

Volume of backfill: 8 ft³ bentonite grout + 1 ft³ hydrated bentonite chips on top = 9 ft³ backfill

MW1a:

Volume of borehole to 15 feet: 4.5 ft³

Volume of backfill: 4 ft³ bentonite grout + 1 ft³ hydrated bentonite chips on top = 5 ft³ backfill

MW2:

Volume of borehole to 30 feet: 7.4 ft³

Volume of backfill: 6.5 ft³ bentonite grout + 1 ft³ hydrated bentonite chips on top = 7.5 ft³ backfill

To summarize, the volume of backfill material placed in each borehole exceeded the calculated volume of that borehole, indicating the boreholes were adequately abandoned.

If you have any questions, please contact me at (949) 756-7526.

Sincerely,

Tetra Tech EC

Mark Cutler, P.G.
Project Manager



Attachments: Well Location Map
Copy of Permit



1940 E. Deere Avenue, Suite 200, Santa Ana, CA 92705
Tel 949 756-7500 Fax 949 756-7560
www.tetratech.com



PERMIT #LMON103667
A.P.N. #101-520-14-00
EST #H05939-266/267/306

**COUNTY OF SAN DIEGO
DEPARTMENT OF ENVIRONMENTAL HEALTH
LAND AND WATER QUALITY DIVISION
MONITORING WELL PROGRAM**

MONITORING WELL AND BORING CONSTRUCTION AND DESTRUCTION PERMIT

SITE NAME: BUILDINGS 14137, 14131, 1441

SITE ADDRESS: AREA 14, MARINE CORPS BASE, CAMP PENDLETON

PERMIT TO: **INSTALL 6 & DESTROY 5 GROUNDWATER MONITORING WELLS**

PERMIT APPROVAL DATE: JANUARY 6, 2006

PERMIT EXPIRES ON: MAY 6, 2006

RESPONSIBLE PARTY: U.S. MARINE CORPS, CAMP PENDLETON

PERMIT CONDITIONS:

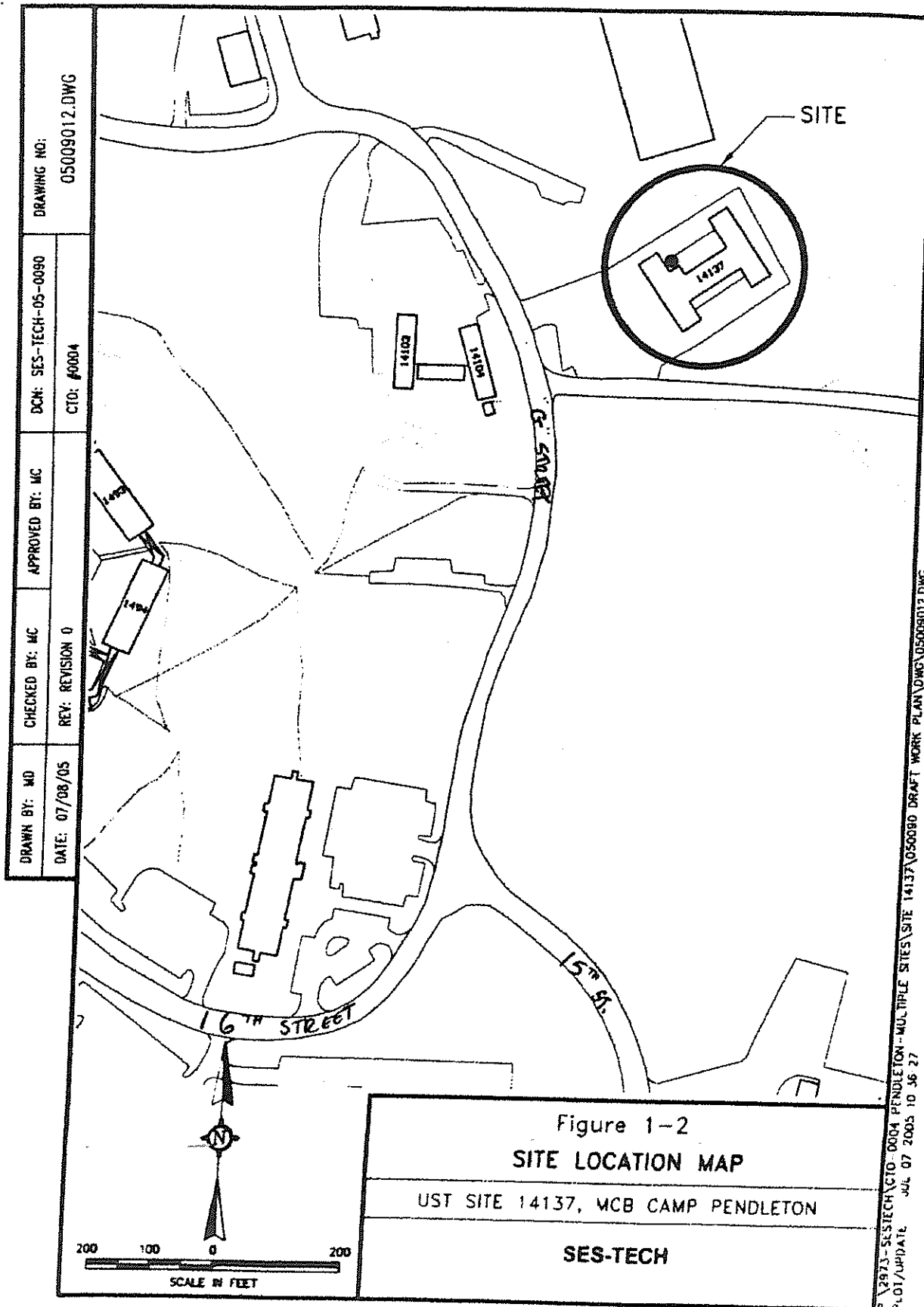
1. Each of the monitoring wells must be constructed with a minimum annular seal of 5 feet and a maximum screened interval of 15 feet.
2. Contact the Regional Water Quality Control Board for their comments and concerns prior to commencing field activities.
3. Wells must have a minimum 3-foot concrete surface seal. The surface seal shall consist of concrete able to withstand the maximum anticipated load without cracking or deteriorating. The concrete should meet Class A specifications of a minimum 4000-pound compressive strength.
4. For the well destructions, all material within the original borehole, which includes the casing, filterpack and annular seal, must be removed. The borehole must be completely filled with an approved sealing material as specified in Department of Water Resources Bulletin 74-90.
5. All water and soil resulting from the activities covered by this permit must be managed, stored and disposed of as specified in the SAM Manual in Section 5, II, E- 4. (http://www.sdcountry.ca.gov/deh/lwq/sam/manual_guidelines.html). In addition, drill cuttings must be properly handled and disposed in compliance with the Stormwater Best Management Practices of the local jurisdiction.
6. Within 60 days of completing work, submit a well construction report, including all well and/or boring logs and laboratory data to the Well Permit Desk. This report must include all items required by the SAM Manual, Section 5, Pages 6 & 7.
7. This office must be given 48-hour notice of any drilling activity on this site and advanced notification of drilling cancellation. Please contact the Well Permit Desk at 338-2339.

APPROVED BY: _____

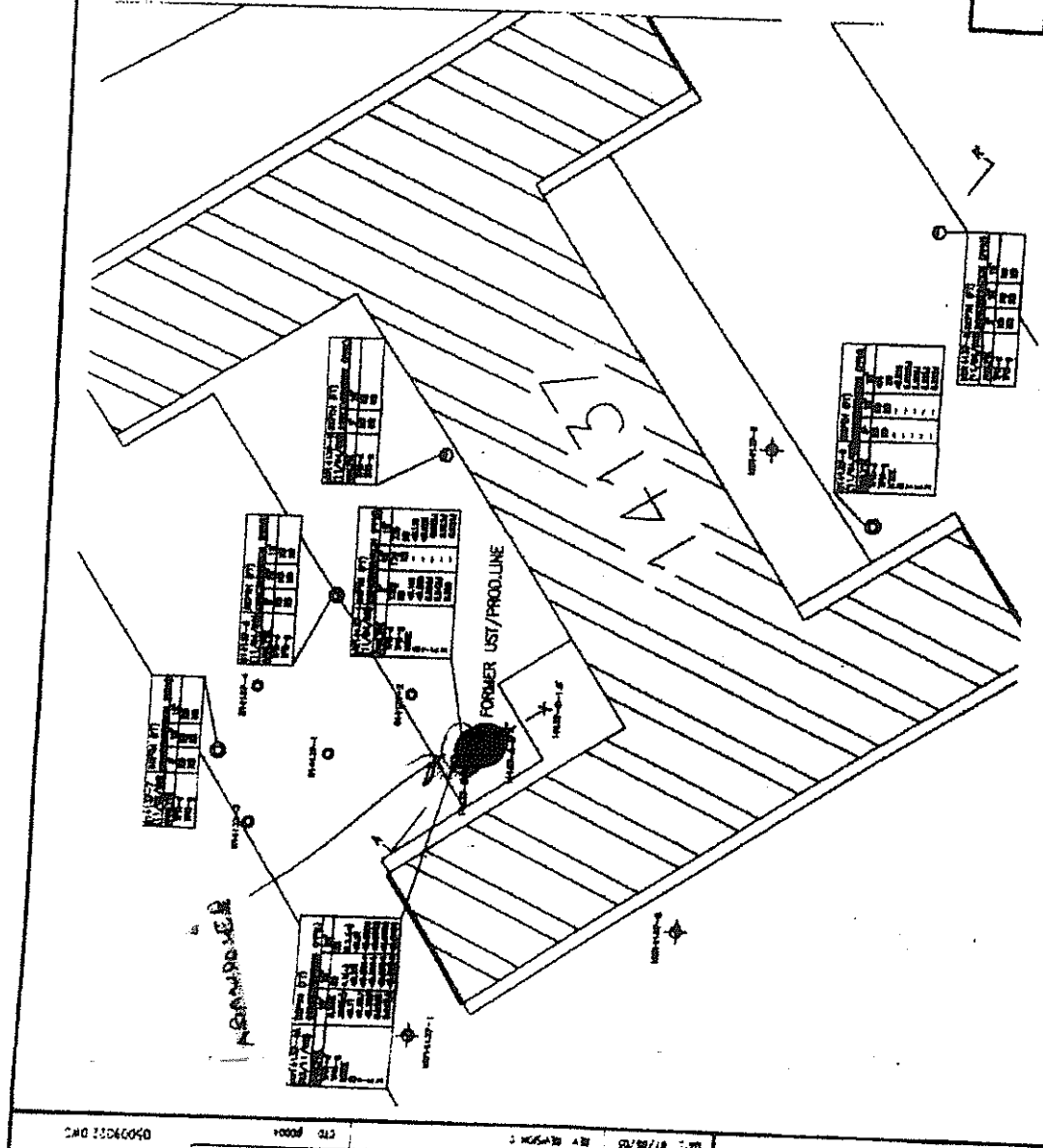
KEVIN HEATON

DATE: 01/06/2006

NOTIFIED: *by email 1/6/06 msc*
DEH: SAM-9075 (3/05)



DATE: 07/08/03	BY: [signature]	REV: 00001	DATE: 07/08/03
DESIGNED BY: [signature]	CHECKED BY: [signature]	DATE: 07/08/03	BY: [signature]
PROJECT NO: 050090022	PROJECT NO: 050090022	PROJECT NO: 050090022	PROJECT NO: 050090022



LEGEND

- UST REMOVAL SOIL SAMPLE (SEE FIGURE 3)
- BORING BY SOTA (1998 AND 2000)
- MONITORING WELL BY JEG/IT (1992) (SEE FIGURE 3)
- SOTA MONITORING WELL (1998)
- BORING LOCATIONS BY JEG/IT (1991 AND 1992) (SEE FIGURE 3)

SOIL SAMPLE DEPTH AND ANALYTICAL RESULTS (in parentheses per paragraph (PFO))

ANALYTICAL RESULTS:

TPH-4 : DIESEL

TPH-8 : GASOLINE

TPH-10 : GASOLINE

TPH-12 : GASOLINE

TPH-14 : GASOLINE

TPH-16 : GASOLINE

TPH-18 : GASOLINE

TPH-20 : GASOLINE

TPH-22 : GASOLINE

TPH-24 : GASOLINE

TPH-26 : GASOLINE

TPH-28 : GASOLINE

TPH-30 : GASOLINE

TPH-32 : GASOLINE

TPH-34 : GASOLINE

TPH-36 : GASOLINE

TPH-38 : GASOLINE

TPH-40 : GASOLINE

TPH-42 : GASOLINE

TPH-44 : GASOLINE

TPH-46 : GASOLINE

TPH-48 : GASOLINE

TPH-50 : GASOLINE

TPH-52 : GASOLINE

TPH-54 : GASOLINE

TPH-56 : GASOLINE

TPH-58 : GASOLINE

TPH-60 : GASOLINE

TPH-62 : GASOLINE

TPH-64 : GASOLINE

TPH-66 : GASOLINE

TPH-68 : GASOLINE

TPH-70 : GASOLINE

TPH-72 : GASOLINE

TPH-74 : GASOLINE

TPH-76 : GASOLINE

TPH-78 : GASOLINE

TPH-80 : GASOLINE

TPH-82 : GASOLINE

TPH-84 : GASOLINE

TPH-86 : GASOLINE

TPH-88 : GASOLINE

TPH-90 : GASOLINE

TPH-92 : GASOLINE

TPH-94 : GASOLINE

TPH-96 : GASOLINE

TPH-98 : GASOLINE

TPH-100 : GASOLINE

SCALE

0 20 40 FEET

Figure 2-2
HISTORICAL SOIL SAMPLING RESULTS,
SOTA ENVIRONMENTAL (2001)

UST SITE 14137, MCB CAMP PENDLETON
BES-TECH

APPENDIX B

**STOCKPILE WAIVER CERTIFICATE AND SOIL EXCAVATION NON-
HAZARDOUS MATERIALS HAULING MANIFESTS**

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN DIEGO REGION**

9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340
Attention: Land Discharge Unit

RWQCB Regulatory Programs

☐ LDU ☐ DoD/SLEIC ☐ UST/AST/LOP County _____

I. Generator of Temporary Waste Pile

SECTION A: Temporary Waste Pile Waiver Certification

Generator Name: AC/S Environmental Security, MCB Camp Pendleton
 Mailing Address: Box 556008 Bldg. 22168
Camp Pendleton SD CA 92055 760-725-9774 760-725-9774
 Contact: Chet Starrs Remediation Branch Manager

II. Present Status of Temporary Waste Pile

Site Location: Building 1441, 14 Area
 Property Owner Name: U.S. Marine Corps
Camp Pendleton SD CA 92055 APR No: 101-520-14-00
 RWQCB File No.: AUT324 LOP Case No: _____ County (CA, Yuba): 160 Method of Containment: Berm + Plastic Sheeting

Waste Type	Contaminant/Constituent Concentrations							
	Diesel (mg/kg)							
Contaminant Type/Source: <input type="checkbox"/> Gasoline <input checked="" type="checkbox"/> Diesel <input type="checkbox"/> Other Petrol. Hydrocarbons <input type="checkbox"/> Impacted Dredge Spoils <input type="checkbox"/> Other Impacted Soils	Mass	Mass + 0.05% CL	Mass	Mass + 0.05% CL	Mass	Mass + 0.05% CL	Mass	Mass + 0.05% CL
	294.0	356.0						

III. Waste Pile Site Information

Site Conditions Met:
☒ Ground Water Separation
☒ Surface Water Separation
☒ Flood Plain Protection
☒ Cover of Waste Pile
☒ Precipitation/Drainage Control

Discharger/Property Owner: U.S. Marine Corps
 Property Address: Building 1441, 14 Area
Camp Pendleton SD CA 92055
 Contact: Chet Starrs 760-725-9774
 Waste Pile Pile Initiated: 01/31/06

Property Owner Acknowledgment:
 I hereby acknowledge receipt of this notice and acknowledge that I have reviewed any associated reports. By signing this form I acknowledge that the Generator of this waste has certified that all the conditions for the waiver from Waste Discharge Requirements (WDRs) for discharge of specified waste indicated in Section II (above) have been met.

Print Name: C. Starrs Title: Rem. Branch Head
 Signature: [Signature] Date: 13 Feb 06

IV. Generator Certification

I hereby certify that the information provided regarding soil characterization is a complete and accurate representation of the subject soil, and that the soil is not hazardous waste as defined by the California Code of Regulations, Title 22, and by the United States Environmental Protection Agency (Code of Federal Regulations, Title 40), and that all conditions for the waiver from WDRs for discharge of specified waste indicated in Section II (above) have been met.

Print Name: C. Starrs Title: Rem. Branch Head
 Signature: [Signature] Date: 13 Feb 06

California Regional Water Quality Control Board, San Diego Region

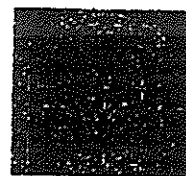
Version: 7/3/02

MAIL CERTIFICATION FORMS TO:

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD SAN DIEGO REGION

9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Attention: Land Discharge Unit Supervisor



V. Final Waste Disposal Information

SECTION B: Temporary Waste Pile Waiver Certification

Final Disposition of Waste <input checked="" type="checkbox"/> Offsite/Landfill disposal <input type="checkbox"/> On-site reuse/disposal <input type="checkbox"/> Off-site reuse/disposal <input type="checkbox"/> Other	Discharger/Property Owner			
	Property Owner/Discharger: U.S. Marine Corps (UST Site 144)			
	Mailing Address: Box 555008, Building 22165			
	City: Camp Pendleton	County: San Diego	State: Ca	Zip: 92055
	Contact Name: Chet Storrs		Phone: 760-725-9774	
	Date(s) Waste Pile(s) Disposed:		Disposal Location(s): Candelaria Environmental 4001, Candelaria Lane, Anza, Ca 92539	

Final Disposal Certification

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

Print Name: C Storrs
 Signature: C Storrs

Title: Res Branch Head
 Date: 13 Feb 06

For Agency Use Only		
RWQCB Regulatory Program:		
<input type="checkbox"/> LDU	<input type="checkbox"/> DoD/SLIC	<input type="checkbox"/> UST/AGT/LOP County _____

CANDELARIA ENVIRONMENTAL
BIOTREATMENT FACILITY
NON-HAZARDOUS MATERIALS HAULING MANIFEST

NE 43074

GENERATOR

NAME: AC/S ENVIRONMENTAL SECURITY (14 AREA)
ADDRESS: P.O. BOX 555008 PHONE NO. (760) 725-9774
CITY, STATE, ZIP: CAMP PENDLETON, CA 92055 APN: 2006-06

WASTE DESCRIPTION NON-HAZ SOIL GENERATING PROCESS UST LEAK
COMPONENTS OF WASTE (PPM) COMPONENTS OF WASTE (PPM)
DIESEL-IMPACTED SOIL UST SITES: 14131/14137/1441

PROPERTIES: SOLID YES
HANDLING INSTRUCTIONS: WEAR APPROPRIATE CLOTHING

GENERATOR CERTIFIES THAT THESE WASTES ARE RCRA NON-HAZARDOUS, AND CALIFORNIA NON-HAZARDOUS, BASED ON THE INFORMATION PROVIDED BY THE GENERATOR ON THE SOIL ACCEPTANCE APPLICATION AND THE ACCOMPANYING LABORATORY DATA

BY: [Signature] DATE: 12/13/06
Signature / Print or Type Full Name

HAULER

COMPANY NAME West Coast PHONE NO. 619-443-4200
ADDRESS P.O. Box 1521 SERVICE ORDER NO.
CITY, STATE, ZIP Lakeside Ca PICK UP DATE 02/13/06
TRUCK TYPE: DUMP ☒ ROLL OFF ☐ OTHER ☐

TRUCK LIC. # 9A81401 TRUCK ID # 1X
DRIVER NAME Jeff Robertson TRAILER LIC. # 1VT4225

DRIVER SIGNATURE [Signature] TRAILER ID # 1XT

PROCESSOR

TIME LEFT JOB 0905 LOAD # 8
JOB SITE REPRESENTATIVE Wendy Bryant [Signature]
Name Signature

Deliver to facility Location:
CANDELARIA ENVIRONMENTAL
4001 Candelaria Lane
Anza, CA 92539
(951) 763-0129

Main office:
Phone: (619) 696-6207
FAX (619) 696-5117
24 hr Emergency (619) 696-6207

CANDELARIA ENVIRONMENTAL
BIOTREATMENT FACILITY
NON-HAZARDOUS MATERIALS HAULING MANIFEST

112 43075

GENERATOR

NAME: AC/S ENVIRONMENTAL SECURITY (14 AREA)
ADDRESS: P.O. BOX 355008 PHONE NO. (760) 725-9774
CITY, STATE, ZIP: CAMP PENDLETON, CA 92055 APN: 2006-06

WASTE DESCRIPTION NON-HAZ SOIL GENERATING PROCESS UST LEAK
COMPONENTS OF WASTE (PPM) COMPONENTS OF WASTE (PPM)
DIESEL-IMPACTED SOIL UST SITES: 14131/14137/1441

PROPERTIES: SOLID YES
HANDLING INSTRUCTIONS: WEAR APPROPRIATE CLOTHING

GENERATOR CERTIFIES THAT THESE WASTES ARE RCRA NON-HAZARDOUS, AND CALIFORNIA NON-HAZARDOUS, BASED ON THE INFORMATION PROVIDED BY THE GENERATOR ON THE SOIL ACCEPTANCE APPLICATION AND THE ACCOMPANYING LABORATORY DATA

BY: [Signature] DATE: 1/31/06
Signature / Print or Type Full Name

HAULER

COMPANY NAME STE Trucking PHONE NO. 619 250 6761
ADDRESS PO Box 1521 SERVICE ORDER NO.
CITY, STATE, ZIP Lakeville, CA PICK UP DATE 02/13/06
TRUCK TYPE: DUMP ☒ ROLL OFF ☐ OTHER ☐

TRUCK LIC. # 5C55846 TRUCK ID # K2

DRIVER NAME Thomas Lee Hays TRAILER LIC. # 11A15102

DRIVER SIGNATURE [Signature] TRAILER ID # K2H

PROCESOR

TIME LEFT JOB 0915 LOAD # 9

JOB SITE REPRESENTATIVE Wendy B [Signature]
Name Signature

Deliver to facility Location:
CANDELARIA ENVIRONMENTAL
4001 Candelaria Lane
Anza, CA 92539
(951) 763-0129

Main office:
Phone: (619) 696-6207
FAX (619) 696-5117
24^{hr} Emergency (619) 696-6207

CANDELARIA ENVIRONMENTAL
BIOTREATMENT FACILITY
NON-HAZARDOUS MATERIALS HAULING MANIFEST

112 43076

GENERATOR

NAME: AC/S ENVIRONMENTAL SECURITY (14 AREA)
ADDRESS: P.O. BOX 555008 PHONE NO. (760) 725-9774
CITY, STATE, ZIP: CAMP PENDLETON, CA 92055 APN: 2006-06

WASTE DESCRIPTION NON-RAZ SOIL GENERATING PROCESS UST LEAK
COMPONENTS OF WASTE (PPM) _____ COMPONENTS OF WASTE (PPM) _____
DIESEL-IMPACTED SOIL UST SITES: 14131(14137)/1441

PROPERTIES: SOLID YES
HANDLING INSTRUCTIONS: WEAR APPROPRIATE CLOTHING

GENERATOR CERTIFIES THAT THESE WASTES ARE RCRA NON-HAZARDOUS, AND CALIFORNIA NON-HAZARDOUS, BASED ON THE INFORMATION PROVIDED BY THE GENERATOR ON THE SOIL ACCEPTANCE APPLICATION AND THE ACCOMPANYING LABORATORY DATA

BY: _____ DATE: 12-15-06
Signature / Print or Type Full Name

HAULER

COMPANY NAME Wendell R/S PHONE NO. 619-443-4200
ADDRESS 1124 G SERVICE ORDER NO. _____
CITY, STATE, ZIP LOKESBURG, CA PICK UP DATE 12-13-06
TRUCK TYPE: DUMP _____ ROLL OFF _____ OTHER _____

TRUCK LIC. # 111111 TRUCK ID # 111111

DRIVER NAME Tim Stuck TRAILER LIC. # GT65914

DRIVER SIGNATURE [Signature] TRAILER ID # 911111

PROCESSOR

TIME LEFT JOB 0930 LOAD # 10

JOB SITE REPRESENTATIVE Wendell Bryant [Signature]
Name Signature

Deliver to facility Location:
CANDELARIA ENVIRONMENTAL
4001 Candelaria Lane
Anza, CA 92539
(951) 763-0129

Main office:
Phone: (619) 696-6207
FAX (619) 696-5117
24^{hr} Emergency (619) 696-6207

CANDELARIA ENVIRONMENTAL
BIOTREATMENT FACILITY
NON-HAZARDOUS MATERIALS HAULING MANIFEST

ME 43077

GENERATOR

NAME: AC/S ENVIRONMENTAL SECURITY (14 AREA)
ADDRESS: P.O. BOX 555008 PHONE NO. (760) 725-9774
CITY, STATE, ZIP: CAMP PENDLETON, CA 92055 APN: 2006-06

WASTE DESCRIPTION NON-HAZ SOIL GENERATING PROCESS UST LEAK
COMPONENTS OF WASTE (PPM) COMPONENTS OF WASTE (PPM)

DIESEL-IMPACTED SOIL

UST SITES: 14131 (14137) 1441

PROPERTIES: SOLID YES

HANDLING INSTRUCTIONS: WEAR APPROPRIATE CLOTHING

GENERATOR CERTIFIES THAT THESE WASTES ARE RCRA NON-HAZARDOUS, AND CALIFORNIA NON-HAZARDOUS, BASED ON THE INFORMATION PROVIDED BY THE GENERATOR ON THE SOIL ACCEPTANCE APPLICATION AND THE ACCOMPANYING LABORATORY DATA

BY: [Signature] DATE: 1/15/06
Signature / Print or Type Full Name

HAULER

COMPANY NAME [Signature] PHONE NO. 770-6725
ADDRESS [Signature] SERVICE ORDER NO. [Signature]
CITY, STATE, ZIP [Signature] PICK UP DATE [Signature]
TRUCK TYPE: DUMP [Signature] ROLL OFF [Signature] OTHER [Signature]

TRUCK LIC. # 754574 TRUCK ID # [Signature]

DRIVER NAME [Signature] TRAILER LIC. # 411111

DRIVER SIGNATURE [Signature] TRAILER ID # [Signature]

PROCESSOR

TIME LEFT JOB 0945 LOAD # 11

JOB SITE REPRESENTATIVE Wendy Bryant [Signature]
Name Signature

Deliver to facility Location:
CANDELARIA ENVIRONMENTAL
4001 Candelaria Lane
Anza, CA 92539
(951) 763-0129

Main office:
Phone: (619) 696-6207
FAX (619) 696-5117
24^{hr} Emergency (619) 696-6207

CANDELARIA ENVIRONMENTAL
BIOTREATMENT FACILITY
NON-HAZARDOUS MATERIALS HAULING MANIFEST

43079

GENERATOR

NAME: AC/S ENVIRONMENTAL SECURITY (14 AREA)
ADDRESS: P.O. BOX 555008 PHONE NO. (760) 725-9774
CITY, STATE, ZIP: CAMP PENDLETON, CA 92055 APN: 2006-06

WASTE DESCRIPTION NON-HAZ SOIL GENERATING PROCESS UST LEAK
COMPONENTS OF WASTE (PPM) _____ COMPONENTS OF WASTE (PPM) _____
DIESEL-IMPACTED SOIL UST SITES: 14131/14137/1441

PROPERTIES: SOLID YES
HANDLING INSTRUCTIONS: WEAR APPROPRIATE CLOTHING

GENERATOR CERTIFIES THAT THESE WASTES ARE RCRA NON-HAZARDOUS, AND CALIFORNIA NON-HAZARDOUS, BASED ON THE INFORMATION PROVIDED BY THE GENERATOR ON THE SOIL ACCEPTANCE APPLICATION AND THE ACCOMPANYING LABORATORY DATA

BY: _____ DATE: 1-13-06
Signature / Print or Type Full Name

HAULER

COMPANY NAME W.C.P.S. PHONE NO. 619-511-3703
ADDRESS _____ SERVICE ORDER NO. _____
CITY, STATE, ZIP Camp Pendleton CA 92046 PICK UP DATE 2-13-06
TRUCK TYPE: DUMP y ROLL OFF _____ OTHER _____

TRUCK LIC. # 1202 PPH4529 TRUCK ID # 1202

DRIVER NAME Wendy Bryant TRAILER LIC. # 46L4554

DRIVER SIGNATURE [Signature] TRAILER ID # _____

TIME LEFT JOB 1115 LOAD # 13 12

JOB SITE REPRESENTATIVE Wendy Bryant [Signature]
Name Signature

PROCESSOR

Deliver to facility Location:
CANDELARIA ENVIRONMENTAL
4001 Candelaria Lane
Anza, CA 92539
(951) 763-0129

Main office:
Phone: (619) 696-6207
FAX (619) 696-5117
24^{hr} Emergency (619) 696-6207

CANDELARIA ENVIRONMENTAL
BIOTREATMENT FACILITY
NON-HAZARDOUS MATERIALS HAULING MANIFEST

NO 43078

GENERATOR

NAME: AC/S ENVIRONMENTAL SECURITY (14 AREA)
ADDRESS: P.O. BOX 555008 PHONE NO. (760) 725-9774
CITY, STATE, ZIP: CAMP PENDLETON, CA 92055 APN: 2006-08

WASTE DESCRIPTION: NON-HAZ SOIL GENERATING PROCESS: UST LEAK
COMPONENTS OF WASTE (PPM):
DIESEL-IMPACTED SOIL COMPONENTS OF WASTE (PPM):
UST SITES: 14131/14137/1441

PROPERTIES: SOLID YES
HANDLING INSTRUCTIONS: WEAR APPROPRIATE CLOTHING

GENERATOR CERTIFIES THAT THESE WASTES ARE RCRA NON-HAZARDOUS, AND CALIFORNIA NON-HAZARDOUS, BASED ON THE INFORMATION PROVIDED BY THE GENERATOR ON THE SOIL ACCEPTANCE APPLICATION AND THE ACCOMPANYING LABORATORY DATA

BY: [Signature] DATE: 13 FEB 06
Signature / Print or Type Full Name

HAULER

COMPANY NAME: WEST COAST DUMP & MORE PHONE NO. 619 561 3903
ADDRESS: PO BOX 1521 SERVICE ORDER NO.
CITY, STATE, ZIP: LAKEVIEW PICK UP DATE: 2-18-06
TRUCK TYPE: DUMP ☒ ROLL OFF ☐ OTHER ☐

TRUCK LIC. # CP 44003 TRUCK ID # 717-7

DRIVER NAME: DAVID TRAILER LIC. # 6465956

DRIVER SIGNATURE: [Signature] TRAILER ID # 717-7+

PROCESSOR

TIME LEFT JOB: 1130 LOAD # 13

JOB SITE REPRESENTATIVE: [Signature]
Name Signature

Deliver to facility Location:
CANDELARIA ENVIRONMENTAL
4001 Candelaria Lane
Anza, CA 92539
(951) 763-0129

Main office:
Phone: (619) 696-6207
FAX (619) 696-5117
24^{HR} Emergency (619) 696-6207

CANDELARIA ENVIRONMENTAL
BIOTREATMENT FACILITY
NON-HAZARDOUS MATERIALS HAULING MANIFEST

112 43080

GENERATOR

NAME: AC/S ENVIRONMENTAL SECURITY (14 AREA)
ADDRESS: P.O. BOX 555008 PHONE NO. (760) 725-9774
CITY, STATE, ZIP: CAMP PENDLETON, CA 92055 APN: 2006-06

WASTE DESCRIPTION NON-HAZ SOIL GENERATING PROCESS UST LEAK
COMPONENTS OF WASTE (PPM) _____ COMPONENTS OF WASTE (PPM) _____
DIESEL-IMPACTED SOIL UST SITES: 14131/14137/1441

PROPERTIES: SOLID YES
HANDLING INSTRUCTIONS: WEAR APPROPRIATE CLOTHING

GENERATOR CERTIFIES THAT THESE WASTES ARE RCRA NON-HAZARDOUS, AND CALIFORNIA NON-HAZARDOUS, BASED ON THE INFORMATION PROVIDED BY THE GENERATOR ON THE SOIL ACCEPTANCE APPLICATION AND THE ACCOMPANYING LABORATORY DATA

BY: [Signature] DATE: 12-1-06
Signature / Print or Type Full Name

HAULER

COMPANY NAME WELLS PHONE NO. 619 541 5725
ADDRESS P.O. BOX 1521 SERVICE ORDER NO. _____
CITY, STATE, ZIP ANZA, CA PICK UP DATE 2-13-07
TRUCK TYPE: DUMP ☒ ROLL OFF _____ OTHER _____

TRUCK LIC. # 6P 791 18 TRUCK ID # 7000-14

DRIVER NAME Don B. [Signature] TRAILER LIC. # 14T14240

DRIVER SIGNATURE [Signature] TRAILER ID # 14T14240

PROCESSOR

TIME LEFT JOB 1145 LOAD # 14

JOB SITE REPRESENTATIVE Wendy Bryant (Signature)
Name Signature

Deliver to facility Location:
CANDELARIA ENVIRONMENTAL
4001 Candelaria Lane
Anza, CA 92539
(951) 763-0129

Main office:
Phone: (619) 696-6207
FAX (619) 696-5117
24^{hr} Emergency (619) 696-6207

APPENDIX C

**LABORATORY ANALYTICAL REPORTS FOR EXCAVATION
CONFIRMATION SOIL SAMPLES AND
EXCAVATION BACKFILL MATERIALS**

COPY

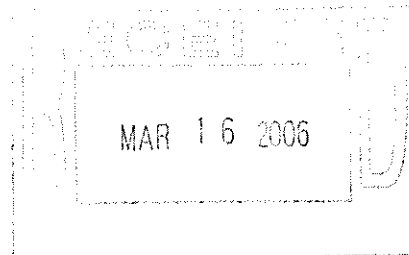


TABLE OF CONTENTS

CLIENT: **SES-TECH**

PROJECT: **CAMP PENDLETON, UST SITE 14137**

SDG: **06B030**

SECTION		PAGE
Cover Letter, COC/Sample Receipt Form		1000 – 1003
GC/MS-VOA	**	2000 –
GC/MS-SVOA	**	3000 –
GC-VOA	**	4000 –
GC-SVOA	METHOD 3550B/8015B	5000 – 5059
HPLC	**	6000 –
METALS	**	7000 –
WET	**	8000 –
OTHERS	**	9000 –

** - Not Requested



LABORATORIES, INC.

1835 W. 205th Street

Torrance, CA 90501

Tel: (310) 618-8889

Fax: (310) 618-0818

Date: 02-14-2006

EMAX Batch No.: 068030

Attn: Nick Weinberger

SES-TECH

1940 E. Deere Avenue, Suite 200

Santa Ana CA 92705

Subject: Laboratory Report

Project: Camp Pendleton, UST Site 14137

Enclosed is the Laboratory report for samples received on 02/03/06.
The data reported include :

Sample ID	Control #	Col Date	Matrix	Analysis
0004-073	B030-01	02/03/06	SOIL	TPH DIESEL
0004-074	B030-02	02/03/06	SOIL	TPH DIESEL
0004-075	B030-03	02/03/06	SOIL	TPH DIESEL
0004-076	B030-04	02/03/06	SOIL	TPH DIESEL
0004-077	B030-05	02/03/06	SOIL	TPH DIESEL
0004-078	B030-06	02/03/06	SOIL	TPH DIESEL
0004-079	B030-07	02/03/06	SOIL	TPH DIESEL
0004-080	B030-08	02/03/06	SOIL	TPH DIESEL
0004-081	B030-09	02/03/06	SOIL	TPH DIESEL
0004-081MS	B030-09M	02/03/06	SOIL	TPH DIESEL
0004-081MSD	B030-09S	02/03/06	SOIL	TPH DIESEL

The results are summarized on the following pages.

Please feel free to call if you have any questions concerning these results.

Sincerely yours,

K. Y. Pang

Kam Y. Pang, Ph.D.

Laboratory Director

NUMBER 04966

CHAIN-OF-CUSTODY RECORD

06B030

PROJECT NAME		PURCHASE ORDER NO.		LABORATORY NAME		
Cano Pendleton		TBD will call		EMAX		
PROJECT LOCATION		PROJECT NO.		ANALYSES REQUIRED		
VST Site 14137		2973.0040		4/3 2/3/06		
SAMPLER NAME		SAMPLER SIGNATURE		LABORATORY ID (FOR LABORATORY)		
Wendy Bryant		[Signature]		06B030		
PROJECT CONTACT		AIRBILL NUMBER		COMMENTS		
Nick Weinberger		Carrier				
SAMPLE ID	DATE COLLECTED	TIME COLLECTED	NO. OF CONTAINER	LEVEL	TYP	TA
				3 4	E	
1 0004-073	2/3/06	1036	2	X	5	48 hr
2 0004-074	2/3/06	1047	2	X	5	48 hr
3 0004-075	2/3/06	1058	2	X	5	48 hr
4 0004-076	2/3/06	1109	2	X	5	48 hr
5 0004-077	2/3/06	1116	2	X	5	48 hr
6 0004-078	2/3/06	1128	2	X	5	48 hr
7 0004-079	2/3/06	1133	2	X	5	48 hr
8 0004-080	2/3/06	1142	2	X	5	48 hr
9 0004-081	2/3/06	1202	4	X	5	48 hr
0004-082	4/3 2/3/06					
0004-083						
RELINQUISHED BY (Signature)		RECEIVED BY (Signature)		LABORATORY INSTRUCTIONS/COMMENTS		
[Signature]		[Signature]		Hold samples for possible SPLP extractions.		
DATE		DATE		COMPOSITE DESCRIPTION		
2/3/06		2/3/06		EMAX		
TIME		TIME				
13:40		16:15				
COMPANY		COMPANY				
FTE		EMAX				
RELINQUISHED BY (Signature)		RECEIVED BY (Signature)		SAMPLE CONDITION UPON RECEIPT (FOR LABORATORY)		
[Signature]		[Signature]		TEMPERATURE: 5.7		
DATE		DATE		SAMPLE CONDITION: <input checked="" type="checkbox"/> INTACT <input type="checkbox"/> BROKEN		
2/3/06		2/3/06		COOLER SEAL: <input checked="" type="checkbox"/> INTACT <input type="checkbox"/> BROKEN		
TIME		TIME				
16:15		16:15				
COMPANY		COMPANY				
FTE		EMAX				



SAMPLE RECEIPT FORM 1

Type of Delivery	Delivered By/Airbill	ECN	068030
<input checked="" type="checkbox"/> EMAX Courier	SEE C.O.C	Receipient	J. WNA
<input type="checkbox"/> Client Delivery		Date	020306
<input type="checkbox"/> Third Party		Time	1645

COC Inspection		
<input type="checkbox"/> Client Name	<input type="checkbox"/> Sampler Name	<input type="checkbox"/> Sampling Date/Time/Location
<input type="checkbox"/> Address	<input checked="" type="checkbox"/> Courier Signature/Date/Time	<input type="checkbox"/> Analysis Required
<input checked="" type="checkbox"/> Client PM/FC	<input type="checkbox"/> TAT	<input checked="" type="checkbox"/> Matrix
<input checked="" type="checkbox"/> Tel #/Fax #	<input type="checkbox"/> Sample ID	<input type="checkbox"/> Preservative (if any)
Safety Issues	<input type="checkbox"/> None	<input type="checkbox"/> Superfund Site Samples
Comments:	<input type="checkbox"/> High Concentrations expected	
	<input type="checkbox"/> Rad Screening Required	

[illegible]

LSCID : Lab Sample Container ID

REVIEWS

Sample Labeling

Date _____

SRF

Date _____

PM

Date _____

REPORTING CONVENTIONS

DATA QUALIFIERS:

Lab Qualifier	AFCEE Qualifier	Description
J	F	Indicates that the analyte is positively identified and the result is less than RL but greater than MDL.
N		Indicates presumptive evidence of a compound.
B	B	Indicates that the analyte is found in the associated method blank as well as in the sample at above QC level.
E	J	Indicates that the result is above the maximum calibration range.
*	*	Out of QC limit.

Note: The above qualifiers are used to flag the results unless the project requires a different set of qualification criteria.

ACRONYMS AND ABBREVIATIONS:

CRDL	Contract Required Detection Limit
RL	Reporting Limit
MRL	Method Reporting Limit
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
DO	Diluted out

DATES

The date and time information for leaching and preparation reflect the beginning date and time of the procedure unless the method, protocol, or project specifically requires otherwise.

LABORATORY REPORT FOR

SES-TECH

CAMP PENDLETON, UST SITE 14137

METHOD 3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

SDG#: 06B030

5000

CASE NARRATIVE

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14137
SDG: 06B030

METHOD 3550B/8015B TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Nine (9) soil samples were received on 02/03/06 for Total Petroleum Hydrocarbons by Extraction analysis by Method 3550B/8015B in accordance with SW846 3RD Edition.

1. Holding Time

Analytical holding time was met. Extraction was performed and completed on 02/06/06.

2. Calibration

Initial calibration was seven points for Diesel. %RSDs were within 20%. Continuing calibrations were carried out at 12-hour intervals and all recoveries were within 85-115%.

3. Method Blank

Method blank was free of contamination at half of the reporting limit.

4. Surrogate Recovery

Surrogate recovery in sample B030-06 and -07 could not be evaluated due to dilution. All others met the QC criteria.

5. Lab Control Sample

Recovery was within QC limits.

6. Matrix Spike/Matrix Spike Duplicate

Sample B030-09 was spiked. Recoveries were within QC limits.

7. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met with the aforementioned exception. Sample results were quantitated from C10 to C24 using Diesel (C10-C24) calibration factor.

Samples B030-03, -04, -06, -07 and -09 displayed diesel-like fuel pattern.

Sample B030-02 displayed motor-oil like fuel pattern.

LAB CHRONICLE
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client : SES-TECH
Project : CAMP PENDLETON, UST SITE 14137
SDG NO. : 068030
Instrument ID : GCT050

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis Date/Time	Extraction Date/Time	Sample Data FN	Calibration Data FN	Prep. Batch	Notes
MBLK1S	DSB013SB	1	NA	02/06/0618:12	02/06/0611:15	TB06004A	TB06003A	DSB013S	Method Blank
LCS1S	DSB013SL	1	NA	02/06/0618:54	02/06/0611:15	TB06005A	TB06003A	DSB013S	Lab Control Sample (LCS)
0004-073	B030-01	1	4.2	02/06/0619:36	02/06/0611:15	TB06006A	TB06003A	DSB013S	Field Sample
0004-074	B030-02	1	5.9	02/07/0600:30	02/06/0611:15	TB06013A	TB06003A	DSB013S	Field Sample
0004-075	B030-03	1	5.4	02/06/0620:18	02/06/0611:15	TB06007A	TB06003A	DSB013S	Field Sample
0004-076	B030-04	1	7.7	02/07/0602:36	02/06/0611:15	TB06016A	TB06003A	DSB013S	Field Sample
0004-077	B030-05	1	6.2	02/06/0621:00	02/06/0611:15	TB06008A	TB06003A	DSB013S	Field Sample
0004-078	B030-06T	10	10.5	02/07/0603:18	02/06/0611:15	TB06017A	TB06014A	DSB013S	Diluted Sample
0004-079	B030-07T	10	6.8	02/07/0604:00	02/06/0611:15	TB06018A	TB06014A	DSB013S	Diluted Sample
0004-080	B030-08	1	4.1	02/06/0621:42	02/06/0611:15	TB06009A	TB06003A	DSB013S	Field Sample
0004-081	B030-09	1	5.6	02/06/0622:24	02/06/0611:15	TB06010A	TB06003A	DSB013S	Field Sample
0004-081MS	B030-09M	1	5.6	02/06/0623:06	02/06/0611:15	TB06011A	TB06003A	DSB013S	Matrix Spike Sample (MS)
0004-081MSD	B030-09S	1	5.6	02/06/0623:48	02/06/0611:15	TB06012A	TB06003A	DSB013S	MS Duplicate (MSD)

FN - Filename
% Moist - Percent Moisture

SAMPLE RESULTS

METHOD 3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : SES-TECH      Date Collected: 02/03/06
Project     : CAMP PENDLETON, UST SITE 14137 Date Received: 02/03/06
Batch No.   : 06B030       Date Extracted: 02/06/06 11:15
Sample ID   : 0004-073     Date Analyzed: 02/06/06 19:36
Lab Samp ID : B030-01      Dilution Factor: 1
Lab File ID : TB06006A     Matrix       : SOIL
Ext Btch ID : DSB013S      % Moisture   : 4.2
Calib. Ref. : TB06003A     Instrument ID : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	ND	10	5.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	107	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

METHOD 3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : SES-TECH                      Date Collected: 02/03/06
Project     : CAMP PENDLETON, UST SITE 14137 Date Received: 02/03/06
Batch No.   : 06B030                      Date Extracted: 02/06/06 11:15
Sample ID   : 0004-074                    Date Analyzed: 02/07/06 00:30
Lab Samp ID : B030-02                     Dilution Factor: 1
Lab File ID : TB06013A                    Matrix       : SOIL
Ext Btch ID : DSB013S                     % Moisture    : 5.9
Calib. Ref. : TB06003A                    Instrument ID : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	780	11	5.3

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	108	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

METHOD 3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : SES-TECH                      Date Collected: 02/03/06
Project     : CAMP PENDLETON, UST SITE 14137 Date Received: 02/03/06
Batch No.   : 068030                       Date Extracted: 02/06/06 11:15
Sample ID   : 0004-075                     Date Analyzed: 02/06/06 20:18
Lab Samp ID : B030-03                      Dilution Factor: 1
Lab File ID : TB06007A                    Matrix       : SOIL
Ext Btch ID : DSB013S                     % Moisture    : 5.4
Calib. Ref. : TB06003A                    Instrument ID : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	1600	11	5.3

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	115	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

METHOD 3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```
=====
Client      : SES-TECH                      Date Collected: 02/03/06
Project     : CAMP PENDLETON, UST SITE 14137 Date Received: 02/03/06
Batch No.   : 06B030                       Date Extracted: 02/06/06 11:15
Sample ID: 0004-076                       Date Analyzed: 02/07/06 02:36
Lab Samp ID: B030-04                       Dilution Factor: 1
Lab File ID: TB06016A                     Matrix       : SOIL
Ext Btch ID: DSB013S                      % Moisture    : 7.7
Calib. Ref.: TB06014A                     Instrument ID : GCT050
=====
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	53	11	5.4

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	107	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

METHOD 3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

=====
Client : SES-TECH Date Collected: 02/03/06
Project : CAMP PENDLETON, UST SITE 14137 Date Received: 02/03/06
Ch No. : 06B030 Date Extracted: 02/06/06 11:15
Sample ID: 0004-077 Date Analyzed: 02/06/06 21:00
Lab Samp ID: 8030-05 Dilution Factor: 1
Lab File ID: TB06008A Matrix : SOIL
Ext Btch ID: DSB013S % Moisture : 6.2
Calib. Ref.: TB06003A Instrument ID : GCT050
=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	ND	11	5.3

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	105	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

METHOD 3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : SES-TECH                      Date Collected: 02/03/06
Project     : CAMP PENDLETON, UST SITE 14137 Date Received: 02/03/06
Batch No.   : 068030                       Date Extracted: 02/06/06 11:15
Sample ID   : 0004-078                     Date Analyzed: 02/07/06 03:18
Lab Samp ID : 8030-06T                     Dilution Factor: 10
Lab File ID : TB06017A                     Matrix          : SOIL
Ext Btch ID : DS8013S                      % Moisture       : 10.5
Calib. Ref. : TB06014A                     Instrument ID    : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	6700	110	56

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	DO	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

DO : Diluted Out

METHOD 3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client       : SES-TECH                      Date Collected: 02/03/06
Project      : CAMP PENDLETON, UST SITE 14137 Date Received: 02/03/06
Batch No.    : 068030                       Date Extracted: 02/06/06 11:15
Sample ID    : 0004-079                     Date Analyzed: 02/07/06 04:00
Lab Samp ID  : B030-07T                     Dilution Factor: 10
Lab File ID  : TB06018A                     Matrix          : SOIL
Ext Btch ID  : DS8013S                      % Moisture       : 6.8
Calib. Ref.  : TB06014A                     Instrument ID    : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	6200	110	54

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	DO	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

DO : Diluted Out

METHOD 3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : SES-TECH                      Date Collected: 02/03/06
Project     : CAMP PENDLETON, UST SITE 14137 Date Received: 02/03/06
Batch No.   : 06B030                      Date Extracted: 02/06/06 11:15
Sample ID: 0004-080                      Date Analyzed: 02/06/06 21:42
Lab Samp ID: B030-08                      Dilution Factor: 1
Lab File ID: TB06009A                    Matrix       : SOIL
Ext Btch ID: DSB013S                     % Moisture    : 4.1
Calib. Ref.: TB06003A                    Instrument ID : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	ND	10	5.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	105	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

METHOD 3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

=====
Client : SES-TECH Date Collected: 02/03/06
Project : CAMP PENDLETON, UST SITE 14137 Date Received: 02/03/06
Sh No. : 06B030 Date Extracted: 02/06/06 11:15
Sample ID: 0004-081 Date Analyzed: 02/06/06 22:24 /
Lab Samp ID: B030-09 Dilution Factor: 1
Lab File ID: TB06010A Matrix : SOIL
Ext Btch ID: DSB013S % Moisture : 5.6
Calib. Ref.: TB06003A Instrument ID : GCT050
=====

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	14	11	5.3

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	103	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

QC SUMMARIES

METHOD 3550B/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client       : SES-TECH                      Date Collected: NA
Project      : CAMP PENDLETON, UST SITE 14137 Date Received: 02/06/06
Batch No.    : 068030                       Date Extracted: 02/06/06 11:15
Sample ID    : MBLK1S                       Date Analyzed: 02/06/06 18:12
Lab Samp ID  : DSB013SB                     Dilution Factor: 1
Lab File ID  : TB06004A                     Matrix       : SOIL
Ext Btch ID  : DSB013S                      % Moisture    : NA
Calib. Ref.  : TB06003A                     Instrument ID : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/kg)	RL (mg/kg)	MDL (mg/kg)
DIESEL	ND	10	5

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	111	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

EMAX QUALITY CONTROL DATA
LCS ANALYSIS

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14137
BATCH NO.: 06B030
METHOD: METHOD 3550B/8015B

=====

MATRIX: SOIL % MOISTURE: NA
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK1S
LAB SAMP ID: DSB013SB DSB013SL
LAB FILE ID: TB06004A TB06005A
DATE EXTRACTED: 02/06/0611:15 02/06/0611:15 DATE COLLECTED: NA
DATE ANALYZED: 02/06/0618:12 02/06/0618:54 DATE RECEIVED: 02/06/06
PREP. BATCH: DSB013S DSB013S
CALIB. REF: TB06003A TB06003A

ACCESSION:

PARAMETER	BLNK RSLT (mg/kg)	SPIKE AMT (mg/kg)	BS RSLT (mg/kg)	BS % REC	QC LIMIT (%)
Diesel	ND	500	509	102	65-135

=====

SURROGATE PARAMETER	SPIKE AMT (mg/kg)	BS RSLT (mg/kg)	BS % REC	QC LIMIT (%)
Hexacosane	25	28	112	65-135

EMAX QUALITY CONTROL DATA
MS/MSD ANALYSIS

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14137
ATCH NO.: 06B030
HOD: METHOD 3550B/8015B

MATRIX: SOIL % MOISTURE: 5.6
DILUTION FACTOR: 1 1 1
SAMPLE ID: 0004-081
LAB SAMP ID: B030-09 B030-09M B030-09S
LAB FILE ID: TB06010A TB06011A TB06012A
DATE EXTRACTED: 02/06/0611:15 02/06/0611:15 02/06/0611:15 DATE COLLECTED: 02/03/06
DATE ANALYZED: 02/06/0622:24 02/06/0623:06 02/06/0623:48 DATE RECEIVED: 02/03/06
PREP. BATCH: DSB013S DSB013S DSB013S
CALIB. REF: TB06003A TB06003A TB06003A

ACCESSION:

PARAMETER	SMPL RSLT (mg/kg)	SPIKE AMT (mg/kg)	MS RSLT (mg/kg)	MS % REC	SPIKE AMT (mg/kg)	MSD RSLT (mg/kg)	MSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Diesel	13.6	530	535	98	530	538	99	1	65-135	35

SURROGATE PARAMETER	SPIKE AMT (mg/kg)	MS RSLT (mg/kg)	MS % REC	SPIKE AMT (mg/kg)	MSD RSLT (mg/kg)	MSD % REC	QC LIMIT (%)
Hexacosane	26.5	29.2	110	26.5	29.2	110	65-135

COPY

TABLE OF CONTENTS

MAR 14 1995

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14137
SDG: 06B030A

SECTION	PAGE
Cover Letter, COC/Sample Receipt Form	1000 – 1004
GC/MS-VOA SW 1312/5030B/8260B	2000 – 2120
GC/MS-SVOA SW 1312/3520C/8270C SIM	3000 – 3111
GC-VOA **	4000 –
GC-SVOA METHOD 1312/3520C/8015B	5000 – 5048
HPLC **	6000 –
METALS **	7000 –
WET **	8000 –
OTHERS **	9000 –

** - Not Requested



LABORATORIES, INC.

1835 W. 205th Street

Torrance, CA 90501

Tel: (310) 618-8889

Fax: (310) 618-0818

Date: 02-24-2006

EMAX Batch No.: 06B030A

Attn: Nick Weinberger

SES-TECH

1940 E. Deere Avenue, Suite 200

Santa Ana CA 92705

Subject: Laboratory Report

Project: Camp Pendleton, UST Site 14137

Enclosed is the Laboratory report for samples received on 02/03/06.

The data reported include :

Sample ID	Control #	Col Date	Matrix	Analysis
0004-075	B030-03	02/03/06	SOIL	VOLATILE ORGANICS SPLP TPH DIESEL SPLP SEMIVOLATILE ORGANICS SPLP
0004-078	B030-06	02/03/06	SOIL	VOLATILE ORGANICS SPLP TPH DIESEL SPLP SEMIVOLATILE ORGANICS SPLP
0004-079	B030-07	02/03/06	SOIL	VOLATILE ORGANICS SPLP TPH DIESEL SPLP SEMIVOLATILE ORGANICS SPLP

The results are summarized on the following pages.

Please feel free to call if you have any questions concerning these results.

Sincerely yours,

Kam Y. Pang, Ph.D.

Laboratory Director

CHANGE ORDER FORM

SDG 06B030A TAT 5 day Project Code SES0601
Requested by Richard B Date Requested 2/9/06 Due Date 2/16/06

Analytical Requirements

AXO	EMAX Control Number	Sample Prep. Methods	Analytical Methods	Special Instructions
A	06B030-03	1312/5030B	8260B	SPLP VOCs
		1312/3520C	8015B	SPLP Diesel
		1312/3520C	8270SIM	SPLP PAHs
	-06	_____		SPLP (VOCs, Diesel, PAHs by 8270
	-07	_____		SPLP (VOCs, Diesel, PAHs by 8270 SIM)

A-additional
X-cancelled
O-others (specify)

1001

opened (3) folders for SPLP VOCs, SPLP Diesel & SPLP PAHs

2/10/06 J. Jones

Richard Beauvil

From: Nick Weinberger@tteci.com
Sent: Thursday, February 09, 2006 2:22 PM
To: Richard Beauvil
Cc: Mark.Cutler@tteci.com; Wendy Bryant@tteci.com
Subject: Re: 06B030

Ricahrd,

Please analyze sample numbers 0004-075, 0004-078, and 0004-079 from SDG 06B030 for SPLP VOC's, SPLP TPH-d, and SPLP PAH's. Call me if you have any questions.

Nick

Nicholas Weinberger
Tetra Tech EC Inc.
Phone: (949)756-7588
Fax: (949)756-7583
E-mail: Nick.Weinberger@tteci.com

1002

2/9/06

CHAIN-OF-CUSTODY RECORD

NUMBER 049

0618030

LABORATORY

E

LABORATORY
(FOR LABORA

CON

(619) 234-8696

PROJECT NAME Camp Pendleton
PROJECT LOCATION UST Site 14137
SAMPLER NAME Wendy Bryant
PROJECT CONTACT Nick Weinberger
PURCHASE ORDER NO. TBD Will call
PROJECT NO. 2973.0040
SAMPLER SIGNATURE [Signature]
AIRBILL NUMBER Courier
NUMBER 049 068030
ANALYSES REQUIRED

SAMPLE ID	DATE COLLECTED	TIME COLLECTED	NO. OF CONTAINER	LEVEL		TYPE	TAT
				3	4		
0004 - 073	2/3/06	1036	2	X		5 hr	X
0004 - 074	2/3/06	1047	2	X		5 hr	X
0004 - 075	2/3/06	1058	2	X		5 hr	X
0004 - 076	2/3/06	1109	2	X		5 hr	X
0004 - 077	2/3/06	1116	2	X		5 hr	X
0004 - 078	2/3/06	1128	2	X		5 hr	X
0004 - 079	2/3/06	1133	2	X		5 hr	X
0004 - 080	2/3/06	1142	2	X		5 hr	X
0004 - 081	2/3/06	1202	4	X		5 hr	X
0004 - 082	2/3/06						
0004 - 083	2/3/06						

LABORATORY INSTRUCTIONS/COMMENTS Hold samples for possible SPLP extraction.
COMPOSITE DESCRIPTION
SAMPLE CONDITION UPON RECEIPT (FOR LABORATORY)
TEMPERATURE: 8.7
COOLER SEAL: [X] INTACT [] BROKEN
[X] INTACT [] BROKEN
White - Laboratory; Pink - Laboratory; Canary - Project File; Manila - Data Management

REPORTING CONVENTIONS

DATA QUALIFIERS:

Lab Qualifier	AFCEE Qualifier	Description
J	F	Indicates that the analyte is positively identified and the result is less than RL but greater than MDL.
N		Indicates presumptive evidence of a compound.
B	B	Indicates that the analyte is found in the associated method blank as well as in the sample at above QC level.
E	J	Indicates that the result is above the maximum calibration range.
*	*	Out of QC limit.

Note: The above qualifiers are used to flag the results unless the project requires a different set of qualification criteria.

ACRONYMS AND ABBREVIATIONS:

CRDL	Contract Required Detection Limit
RL	Reporting Limit
MRL	Method Reporting Limit
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
DO	Diluted out

DATES

The date and time information for leaching and preparation reflect the beginning date and time of the procedure unless the method, protocol, or project specifically requires otherwise.

LABORATORY REPORT FOR

SES-TECH

CAMP PENDLETON, UST SITE 14137

SW 1312/5030B/8260B
SPLP VOLATILE ORGANICS BY GC/MS

SDG#: 06B030A

2000

CASE NARRATIVE

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14137
SDG: 06B030A

SW 1312/5030B/8260B SPLP VOLATILE ORGANICS BY GC/MS

Three (3) soil samples were received on 02/03/06 for SPLP Volatile Organic analysis by Method 1312/5030B/8260B in accordance with USEPA SW846, 3rd ed.

1. Holding Time

Analytical holding time was met.

2. Tuning and Calibration

Tuning and calibration were carried out at 12-hour interval. All QC requirements were met.

3. Method Blank

Method blanks were free of contamination at half of the reporting limit.

4. Surrogate Recovery

Recoveries were within QC limit.

5. Lab Control Sample/Lab Control Sample Duplicate

Recoveries were within QC limit.

6. Matrix Spike/Matrix Spike Duplicate

No MS/MSD sample was designated in this SDG.

7. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

LAB CHRONICLE
SPLP VOLATILE ORGANICS BY GC/MS

Client : SES-TECH
Project : CAMP PENDLETON, UST SITE 14137

SDG NO. : 068030A
Instrument ID : T-001

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	WATER		Extraction Date/Time	Sample Data FN	Calibration Prep.		Notes
				Analysis Date/Time				Data FN	Batch	
MBLK1W	V001B29Q	1	NA	02/15/0616:26		02/15/0616:26	RBV366	RAV257	V001B29	Method Blank
LCS1W	V001B29X	1	NA	02/15/0614:32		02/15/0614:32	RBV363	RAV257	V001B29	Lab Control Sample (LCS)
LCD1W	V001B29Y	1	NA	02/15/0615:11		02/15/0615:11	RBV364	RAV257	V001B29	LCS Duplicate
MBLK1S	SLB002SB	1	NA	02/15/0617:07		02/15/0617:07	RBV367	RAV257	V001B29	Method Blank
0004-075	8030-03	1	NA	02/15/0620:55		02/15/0620:55	RBV373	RAV257	V001B29	Field Sample
0004-078	8030-06	1	NA	02/15/0621:32		02/15/0621:32	RBV374	RAV257	V001B29	Field Sample
0004-079	8030-07	1	NA	02/15/0622:10		02/15/0622:10	RBV375	RAV257	V001B29	Field Sample

FN - Filename
% Moist - Percent Moisture

SAMPLE RESULTS


```

=====
Client      : SES-TECH                      Date Collected: 02/03/06
Project     : CAMP PENDLETON, UST SITE 14137 Date Received: 02/03/06
Sample No.  : 06B030A                      Date Extracted: 02/15/06 20:55
Sample ID   : 0004-075                     Date Analyzed: 02/15/06 20:55
Lab Samp ID : B030-03                      Dilution Factor: 1
Lab File ID : RBV373                      Matrix          : WATER
Ext Btch ID : V001829                     % Moisture      : NA
Calib. Ref. : RAV257                      Instrument ID   : T-001
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	5	.2
1,1,2,2-TETRACHLOROETHANE	ND	1	.2
1,1,2-TRICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHENE	ND	5	.2
1,2-DICHLOROETHANE	ND	.5	.2
1,2-DICHLOROPROPANE	ND	5	.2
METHYL ETHYL KETONE	ND	50	.2
2-HEXANONE	ND	50	5
4-METHYL-2-PENTANONE (MIBK)	ND	50	5
ACETONE	ND	50	5
BENZENE	ND	.5	.2
BROMODICHLOROMETHANE	ND	5	.2
BROMOFORM	ND	5	.3
BROMOMETHANE	ND	5	.2
CARBON TETRACHLORIDE	ND	.5	.2
CHLOROBENZENE	ND	5	.2
CHLOROETHANE	ND	5	.2
CHLOROFORM	ND	5	.2
CHLOROMETHANE	ND	5	.2
CIS-1,2-DICHLOROETHENE	ND	5	.2
CIS-1,3-DICHLOROPROPENE	ND	.5	.2
BROMOCHLOROMETHANE	ND	5	.2
1,2-DIBENZENE	.51	.5	.2
ETHYLENES	.83J	5	.2
MTBE	ND	1	.2
METHYLENE CHLORIDE	ND	5	.5
STYRENE	ND	5	.2
1,1,2,2-TETRACHLOROETHYLENE	ND	5	.2
TOLUENE	ND	.5	.2
TRANS-1,2-DICHLOROETHENE	ND	5	.2
TRANS-1,3-DICHLOROPROPENE	ND	.5	.2
TRICHLOROETHENE	ND	5	.2
VINYL ACETATE	ND	50	.5
VINYL CHLORIDE	ND	.5	.2
TERT-BUTYL ALCOHOL	ND	20	5
DIISOPROPYL ETHER	ND	5	.2
ETHYL TERT-BUTYL ETHER	ND	5	.2
TERT-AMYL METHYL ETHER	ND	5	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	106	65-135
TOLUENE-D8	102	75-125
BROMOFLUOROBENZENE	108	75-125

R.L. : Reporting limit
 * : Out of QC
 E : Exceeded calibration range
 B : Found in associated method blank
 J : Value between R.L. and MDL
 D : Value from dilution analysis
 O.O. : Diluted out
 SPLP Extraction Date: 02/11/06 13:00

```

=====
Client      : SES-TECH                      Date Collected: 02/03/06
Project     : CAMP PENDLETON, UST SITE 14137 Date Received: 02/03/06
Batch No.   : 06B030A                      Date Extracted: 02/15/06 21:32
Sample ID   : 0004-078                     Date Analyzed: 02/15/06 21:32
Lab Samp ID : B030-06                      Dilution Factor: 1
Lab File ID : RBV374                      Matrix       : WATER
Ext Btch ID : V001B29                     % Moisture    : NA
Calib. Ref. : RAV257                      Instrument ID : T-001
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	5	.2
1,1,2,2-TETRACHLOROETHANE	ND	1	.2
1,1,2-TRICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHENE	ND	5	.2
1,2-DICHLOROETHANE	ND	.5	.2
1,2-DICHLOROPROPANE	ND	5	.2
METHYL ETHYL KETONE	ND	50	.2
2-HEXANONE	ND	50	5
4-METHYL-2-PENTANONE (MIBK)	ND	50	5
ACETONE	ND	50	5
BENZENE	ND	.5	.2
BROMODICHLOROMETHANE	ND	5	.2
BROMOFORM	ND	5	.3
BROMOMETHANE	ND	5	.2
CARBON TETRACHLORIDE	ND	.5	.2
CHLOROBENZENE	ND	5	.2
CHLOROETHANE	ND	5	.2
CHLOROFORM	ND	5	.2
CHLOROMETHANE	ND	5	.2
CIS-1,2-DICHLOROETHENE	ND	5	.2
CIS-1,3-DICHLOROPROPENE	ND	.5	.2
DIBROMOCHLOROMETHANE	ND	5	.2
ETHYLBENZENE	5.3	.5	.2
XYLENES	6.8	5	.2
MTBE	ND	1	.2
METHYLENE CHLORIDE	ND	5	.5
STYRENE	ND	5	.2
TETRACHLOROETHYLENE	ND	5	.2
TOLUENE	.65	.5	.2
TRANS-1,2-DICHLOROETHENE	ND	5	.2
TRANS-1,3-DICHLOROPROPENE	ND	.5	.2
TRICHLOROETHENE	ND	5	.2
VINYL ACETATE	ND	50	.5
VINYL CHLORIDE	ND	.5	.2
TERT-BUTYL ALCOHOL	ND	20	5
DIISOPROPYL ETHER	ND	5	.2
ETHYL TERT-BUTYL ETHER	ND	5	.2
TERT-AMYL METHYL ETHER	ND	5	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	103	65-135
TOLUENE-D8	100	75-125
BROMOFLUOROBENZENE	104	75-125

R.L. : Reporting limit
 * : Out of QC
 E : Exceeded calibration range
 B : Found in associated method blank
 J : Value between R.L. and MDL
 D : Value from dilution analysis
 D.O. : Diluted out
 SPLP Extraction Date: 02/11/06 13:00

2005

```

=====
Client   : SES-TECH                      Date Collected: 02/03/06
Project  : CAMP PENDLETON, UST SITE 14137 Date Received: 02/03/06
In No.   : 06B030A                      Date Extracted: 02/15/06 22:10
Sample ID: 0004-079                      Date Analyzed: 02/15/06 22:10
Lab Samp ID: B030-07                     Dilution Factor: 1
Lab File ID: RBV375                      Matrix       : WATER
Ext Btch ID: V001B29                     % Moisture   : NA
Calib. Ref.: RAV257                      Instrument ID : T-001
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	5	.2
1,1,2,2-TETRACHLOROETHANE	ND	1	.2
1,1,2-TRICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHENE	ND	5	.2
1,2-DICHLOROETHANE	ND	.5	.2
1,2-DICHLOROPROPANE	ND	5	.2
METHYL ETHYL KETONE	ND	50	.2
2-HEXANONE	ND	50	5
4-METHYL-2-PENTANONE (MIBK)	ND	50	5
ACETONE	ND	50	5
BENZENE	ND	.5	.2
BROMODICHLOROMETHANE	ND	5	.2
BROMOFORM	ND	5	.3
BROMOMETHANE	ND	5	.2
CARBON TETRACHLORIDE	ND	.5	.2
CHLOROBENZENE	ND	5	.2
CHLOROETHANE	ND	5	.2
CHLOROFORM	ND	5	.2
CHLOROMETHANE	ND	5	.2
CIS-1,2-DICHLOROETHENE	ND	5	.2
CIS-1,3-DICHLOROPROPENE	ND	.5	.2
BROMOCHLOROMETHANE	ND	5	.2
1,2-DIBENZENE	4.8	.5	.2
ETHYLENES	7.9	5	.2
MTBE	ND	1	.2
METHYLENE CHLORIDE	ND	5	.5
STYRENE	ND	5	.2
PERFLUOROTETRACHLOROETHYLENE	ND	5	.2
TOLUENE	.63	.5	.2
TRANS-1,2-DICHLOROETHENE	ND	5	.2
TRANS-1,3-DICHLOROPROPENE	ND	.5	.2
TRICHLOROETHENE	ND	5	.2
VINYL ACETATE	ND	50	.5
VINYL CHLORIDE	ND	.5	.2
TERT-BUTYL ALCOHOL	ND	20	5
DIISOPROPYL ETHER	ND	5	.2
ETHYL TERT-BUTYL ETHER	ND	5	.2
TERT-AMYL METHYL ETHER	ND	5	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	103	65-135
TOLUENE-D8	98	75-125
BROMOFLUOROBENZENE	108	75-125

R.L. : Reporting limit
 * : Out of QC
 E : Exceeded calibration range
 B : Found in associated method blank
 J : Value between R.L. and MDL
 D : Value from dilution analysis
 D.O. : Diluted out
 SPLP Extraction Date: 02/11/06 13:00

2014

QC SUMMARIES


```

=====
Client       : SES-TECH                      Date Collected: NA
Project      : CAMP PENDLETON, UST SITE 14137 Date Received: 02/15/06
Batch No.    : 06B030A                      Date Extracted: 02/15/06 16:26
Sample ID    : MBLK1W                       Date Analyzed: 02/15/06 16:26
Lab Samp ID  : V001B29Q                     Dilution Factor: 1
Lab File ID  : RBV366                       Matrix          : WATER
Ext Btch ID  : V001B29                      % Moisture      : NA
Calib. Ref.  : RAV257                       Instrument ID   : T-001
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	5	.2
1,1,2,2-TETRACHLOROETHANE	ND	1	.2
1,1,2-TRICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHENE	ND	5	.2
1,2-DICHLOROETHANE	ND	.5	.2
1,2-DICHLOROPROPANE	ND	5	.2
METHYL ETHYL KETONE	ND	50	.2
2-HEXANONE	ND	50	5
4-METHYL-2-PENTANONE (MIBK)	ND	50	5
ACETONE	ND	50	5
BENZENE	ND	.5	.2
BROMODICHLOROMETHANE	ND	5	.2
BROMOFORM	ND	5	.3
BROMOMETHANE	ND	5	.2
CARBON TETRACHLORIDE	ND	.5	.2
CHLOROBENZENE	ND	5	.2
CHLOROETHANE	ND	5	.2
CHLOROFORM	ND	5	.2
CHLOROMETHANE	ND	5	.2
CIS-1,2-DICHLOROETHENE	ND	5	.2
CIS-1,3-DICHLOROPROPENE	ND	.5	.2
DIBROMOCHLOROMETHANE	ND	5	.2
1,2-DIBROMOETHANE	ND	.5	.2
MTBE	ND	5	.2
METHYLENE CHLORIDE	ND	1	.2
STYRENE	ND	5	.5
TETRACHLOROETHYLENE	ND	5	.2
TOLUENE	ND	.5	.2
TRANS-1,2-DICHLOROETHENE	ND	5	.2
TRANS-1,3-DICHLOROPROPENE	ND	.5	.2
TRICHLOROETHENE	ND	5	.2
VINYL ACETATE	ND	50	.5
VINYL CHLORIDE	ND	.5	.2
TERT-BUTYL ALCOHOL	ND	20	5
DIISOPROPYL ETHER	ND	5	.2
ETHYL TERT-BUTYL ETHER	ND	5	.2
TERT-AMYL METHYL ETHER	ND	5	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	94	65-135
TOLUENE-D8	100	75-125
BROMOFLUOROBENZENE	108	75-125

R.L. : Reporting limit
 * : Out of QC
 E : Exceeded calibration range
 B : Found in associated method blank
 J : Value between R.L. and MDL
 D : Value from dilution analysis
 D.O. : Diluted out

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS



CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14137
BATCH NO.: 068030A
METHOD: SW 1312/5030B/8260B

MATRIX: WATER
DILUTION FACTOR: 1 1 1
SAMPLE ID: MBLK1W
LAB SAMP ID: V001B29Q V001B29X V001B29Y
LAB FILE ID: RBV366 RBV363 RBV364
DATE EXTRACTED: 02/15/0616:26 02/15/0614:32 02/15/0615:11 DATE COLLECTED: NA
DATE ANALYZED: 02/15/0616:26 02/15/0614:32 02/15/0615:11 DATE RECEIVED: 02/15/06
PREP. BATCH: V001B29 V001B29 V001B29
CALIB. REF: RAV257 RAV257 RAV257

ACCESSION:

PARAMETER	BLNK RSLT (ug/L)	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
1,1-Dichloroethene	ND	10	9.03	90	10	9.22	92	2	75-125	20
Benzene	ND	10	9.37	94	10	9.81	98	5	75-125	20
Chlorobenzene	ND	10	9.95	100	10	10.7	107	7	75-125	20
Toluene	ND	10	9.37	94	10	9.83	98	5	75-125	20
Trichloroethene	ND	10	10.2	102	10	10.6	106	4	75-125	20

SURROGATE PARAMETER	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	QC LIMIT (%)
1,2-Dichloroethane-d4	10	8.32	83	10	10	100	65-135
Toluene-d8	10	9.46	95	10	10.8	108	75-125
Bromofluorobenzene	10	9.88	99	10	11.1	111	75-125

2017

```

=====
Client   : SES-TECH                      Date Collected: NA
Project  : CAMP PENDLETON, UST SITE 14137 Date Received: 02/15/06
No.      : 06B030A                      Date Extracted: 02/15/06 17:07
File ID: MBLK1S                          Date Analyzed: 02/15/06 17:07
Lab Samp ID: SLB002SB                    Dilution Factor: 1
Lab File ID: RBV367                      Matrix       : WATER
Ext Btch ID: V001B29                    % Moisture    : NA
Calib. Ref.: RAV257                      Instrument ID : T-001
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	5	.2
1,1,2,2-TETRACHLOROETHANE	ND	1	.2
1,1,2-TRICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHENE	ND	5	.2
1,2-DICHLOROETHANE	ND	.5	.2
1,2-DICHLOROPROPANE	ND	5	.2
METHYL ETHYL KETONE	ND	50	.2
2-HEXANONE	ND	50	5
4-METHYL-2-PENTANONE (MIBK)	ND	50	5
ACETONE	ND	50	5
BENZENE	ND	.5	.2
BROMODICHLOROMETHANE	ND	5	.2
BROMOFORM	ND	5	.3
BROMOMETHANE	ND	5	.2
CARBON TETRACHLORIDE	ND	.5	.2
CHLOROBENZENE	ND	5	.2
CHLOROETHANE	ND	5	.2
CHLOROFORM	ND	5	.2
CHLOROMETHANE	ND	5	.2
CIS-1,2-DICHLOROETHENE	ND	5	.2
CIS-1,3-DICHLOROPROPENE	ND	.5	.2
DIBROMOCHLOROMETHANE	ND	5	.2
DIBROMOBENZENE	ND	.5	.2
DIBROMOETHANE	ND	5	.2
MTBE	ND	1	.2
METHYLENE CHLORIDE	ND	5	.5
STYRENE	ND	5	.2
TETRACHLOROETHYLENE	ND	5	.2
TOLUENE	ND	.5	.2
TRANS-1,2-DICHLOROETHENE	ND	5	.2
TRANS-1,3-DICHLOROPROPENE	ND	.5	.2
TRICHLOROETHENE	ND	5	.2
VINYL ACETATE	ND	50	.5
VINYL CHLORIDE	ND	.5	.2
TERT-BUTYL ALCOHOL	ND	20	5
DIISOPROPYL ETHER	ND	5	.2
ETHYL TERT-BUTYL ETHER	ND	5	.2
TERT-AMYL METHYL ETHER	ND	5	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	92	65-135
TOLUENE-D8	105	75-125
BROMOFLUOROBENZENE	112	75-125

R.L. : Reporting limit
 * : Out of QC
 E : Exceeded calibration range
 B : Found in associated method blank
 J : Value between R.L. and MDL
 D : Value from dilution analysis
 D.O. : Diluted out
 SPLP Extraction Date: 02/11/06 13:00

2018

LABORATORY REPORT FOR

SES-TECH

CAMP PENDLETON, UST SITE 14137

SW 1312/3520C/8270C SIM
SPLP SEMI VOLATILE ORGANICS BY GC/MS

SDG#: 06B030A

3000



CASE NARRATIVE

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14137
SDG: 06B030A

SW 1312/3520C/8270C SIM SPLP SEMI VOLATILE ORGANICS BY GC/MS

Three (3) soil samples were received on 02/03/06 for SPLP Semi Volatile Organic analysis by Method 1312/3520C/8270C SIM in accordance with USEPA SW846, 3rd ed.

1. Holding Time

Analytical holding time was met.

2. Tuning and Calibration

Tuning and calibration were carried out at 12-hour interval. All QC requirements were met.

3. Method Blank

Method blanks were free of contamination at half of the reporting limit.

4. Surrogate Recovery

Recoveries were within QC limit except Terphenyl-d14 in sample B030-03 was out of QC limit.

5. Lab Control Sample/Lab Control Sample Duplicate

Recoveries were within QC limit.

6. Matrix Spike/Matrix Spike Duplicate

No MS/MSD sample was designated in this SDG.

7. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met with the aforementioned exception. Samples B030-06 and B030-07 were analyzed with 10x dilution due to matrix interference.

Two analytes in B030-03, four analytes in B030-06, and two analytes in B030-07 were manually reintegrated to correct for improper integration. Chromatograms of before and after manual integration for B030-06 was submitted for review.

LAB CHRONICLE
SPLP SEMI VOLATILE ORGANICS BY GC/MS

Client : SES-TECH
Project : CAMP PENDLETON, UST SITE 14137
SDG NO. : 068030A
Instrument ID : T-052

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	WATER		Extraction DateTime	Sample Data FN	Calibration Prep.		Notes
				Analysis DateTime				Data FN	Batch	
MBLK1W LCST1W LCD1W MBLK1S	SVB030WB	1	NA	02/16/0618:15	02/15/0619:00	RBK231	RAK026	SVB030W	Method Blank	
	SVB030WL	1	NA	02/16/0618:34	02/15/0619:00	RBK232	RAK026	SVB030W	Lab Control Sample (LCS)	
	SVB030WC	1	NA	02/16/0618:52	02/15/0619:00	RBK233	RAK026	SVB030W	LCS Duplicate	
	SPB002SB	1	NA	02/16/0619:11	02/15/0619:00	RBK234	RAK026	SVB030W	Method Blank	
0004-075	B030-03	1	NA	02/16/0619:49	02/15/0619:00	RBK236	RAK026	SVB030W	Field Sample	
0004-078	B030-06T	10	NA	02/17/0617:20	02/15/0619:00	RBK261	RAK026	SVB030W	Diluted Sample	
0004-079	B030-07T	10	NA	02/17/0617:38	02/15/0619:00	RBK262	RAK026	SVB030W	Diluted Sample	

FN - Filename
% Moist - Percent Moisture

SAMPLE RESULTS


```

=====
Client       : SES-TECH                      Date Collected: 02/03/06
Project      : CAMP PENDLETON, UST SITE 14137 Date Received: 02/03/06
Batch No.    : 06B030A                      Date Extracted: 02/15/06 19:00
Sample ID    : 0004-075                     Date Analyzed: 02/16/06 19:49
Lab Samp ID  : B030-03                      Dilution Factor: 1
Lab File ID  : RBK236                       Matrix          : WATER
Ext Btch ID  : SVB030W                      % Moisture      : NA
Calib. Ref.  : RAK026                       Instrument ID   : T-052
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
ACENAPHTHENE	1.3	1	.2
ACENAPHTHYLENE	ND	1	.2
ANTHRACENE	ND	2	.2
BENZO(A)ANTHRACENE	ND	2	.2
BENZO(A)PYRENE	ND	1	.2
BENZO(B)FLUORANTHENE	ND	1	.2
BENZO(K)FLUORANTHENE	ND	2	.2
BENZO(G,H,I)PERYLENE	ND	1	.2
CHRYSENE	ND	2	.2
DIBENZO(A,H)ANTHRACENE	ND	1	.2
FLUORANTHENE	ND	2	.2
FLUORENE	4	2	.2
INDENO(1,2,3-CD)PYRENE	ND	1	.2
NAPHTHALENE	7.7	1	.2
PHENANTHRENE	6.2	1	.2
PYRENE	ND	2	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
TERPHENYL-D14	25*	50-130

RL: Reporting Limit
SPLP Extraction Date: 02/10/06 18:20

SW 1312/3520C/8270C SIM
SPLP SEMI VOLATILE ORGANICS BY GC/MS

```

=====
Client       : SES-TECH                      Date Collected: 02/03/06
Project      : CAMP PENDLETON, UST SITE 14137 Date Received: 02/03/06
Batch No.    : 068030A                      Date Extracted: 02/15/06 19:00
Sample ID    : 0004-078                     Date Analyzed: 02/17/06 17:20
Lab Samp ID  : 8030-06T                     Dilution Factor: 10
Lab File ID  : RBK261                       Matrix          : WATER
Ext Btch ID  : SVB030W                      % Moisture       : NA
Calib. Ref.  : RAK026                       Instrument ID    : T-052
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
ACENAPHTHENE	6.3J	10	2
ACENAPHTHYLENE	ND	10	2
ANTHRACENE	ND	20	2
BENZO(A)ANTHRACENE	ND	20	2
BENZO(A)PYRENE	ND	10	2
BENZO(B)FLUORANTHENE	ND	10	2
BENZO(K)FLUORANTHENE	ND	20	2
BENZO(G,H,I)PERYLENE	ND	10	2
CHRYSENE	ND	20	2
DIBENZO(A,H)ANTHRACENE	ND	10	2
FLUORANTHENE	ND	20	2
FLUORENE	23	20	2
INDENO(1,2,3-CD)PYRENE	ND	10	2
NAPHTHALENE	65	10	2
PHENANTHRENE	43	10	2
PYRENE	2.2J	20	2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
TERPHENYL-D14	DO	50-130

RL: Reporting Limit
SPLP Extraction Date: 02/10/06 18:20
DO: Diluted Out.

```
=====
Client      : SES-TECH                      Date Collected: 02/03/06
Project     : CAMP PENDLETON, UST SITE 14137 Date Received: 02/03/06
Batch No.   : 06B030A                      Date Extracted: 02/15/06 19:00
Sample ID   : 0004-079                     Date Analyzed: 02/17/06 17:38
Lab Samp ID : B030-07T                     Dilution Factor: 10
Lab File ID : RBK262                       Matrix          : WATER
Ext Btch ID : SVB030W                      % Moisture      : NA
Calib. Ref. : RAK026                       Instrument ID   : T-052
=====
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
ACENAPHTHENE	4.9J	10	2
ACENAPHTHYLENE	ND	10	2
ANTHRACENE	ND	20	2
BENZO(A)ANTHRACENE	ND	20	2
BENZO(A)PYRENE	ND	10	2
BENZO(B)FLUORANTHENE	ND	10	2
BENZO(K)FLUORANTHENE	ND	20	2
BENZO(G,H,I)PERYLENE	ND	10	2
CHRYSENE	ND	20	2
DIBENZO(A,H)ANTHRACENE	ND	10	2
FLUORANTHENE	ND	20	2
FLUORENE	16J	20	2
INDENO(1,2,3-CD)PYRENE	ND	10	2
NAPHTHALENE	54	10	2
PHENANTHRENE	25	10	2
PYRENE	ND	20	2

PROBATE PARAMETERS	% RECOVERY	QC LIMIT
TERPHENYL-D14	DO	50-130

RL: Reporting Limit
SPLP Extraction Date: 02/10/06 18:20
DO: Diluted Out.

QC SUMMARIES

=====
Client : SES-TECH Date Collected: NA
Project : CAMP PENDLETON, UST SITE 14137 Date Received: 02/15/06
Batch No. : 06B030A Date Extracted: 02/15/06 19:00
Sample ID: MBLK1W Date Analyzed: 02/16/06 18:15
Lab Samp ID: SVB030WB Dilution Factor: 1
Lab File ID: RBK231 Matrix : WATER
Ext Btch ID: SVB030W % Moisture : NA
Calib. Ref.: RAK026 Instrument ID : T-052
=====

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
ACENAPHTHENE	ND	1	.2
ACENAPHTHYLENE	ND	1	.2
ANTHRACENE	ND	2	.2
BENZO(A)ANTHRACENE	ND	2	.2
BENZO(A)PYRENE	ND	1	.2
BENZO(B)FLUORANTHENE	ND	1	.2
BENZO(K)FLUORANTHENE	ND	2	.2
BENZO(G,H,I)PERYLENE	ND	1	.2
CHRYSENE	ND	2	.2
DIBENZO(A,H)ANTHRACENE	ND	1	.2
FLUORANTHENE	ND	2	.2
FLUORENE	ND	2	.2
INDENO(1,2,3-CD)PYRENE	ND	1	.2
NAPHTHALENE	ND	1	.2
PHENANTHRENE	ND	1	.2
PYRENE	ND	2	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
TERPHENYL-D14	122	50-130

RL: Reporting Limit

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS



CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14137
BATCH NO.: 06B030A
METHOD: SW 1312/3520C/8270C SIM

MATRIX: WATER % MOISTURE: NA
DILUTION FACTOR: 1 1 1
SAMPLE ID: MBLK1W
LAB SAMP ID: SVB030WB SVB030WL SVB030WC
LAB FILE ID: RBK231 RBK232 RBK233
DATE EXTRACTED: 02/15/0619:00 02/15/0619:00 02/15/0619:00 DATE COLLECTED: NA
DATE ANALYZED: 02/16/0618:15 02/16/0618:34 02/16/0618:52 DATE RECEIVED: 02/15/06
PREP. BATCH: SVB030W SVB030W SVB030W
CALIB. REF: RAK026 RAK026 RAK026

ACCESSION:

PARAMETER	BLNK RSLT (ug/L)	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Acenaphthene	ND	10	5.74	57	10	6.68	67	15	40-130	30
Acenaphthylene	ND	10	6.3	63	10	7.14	71	12	40-130	30
Anthracene	ND	10	7.25	73	10	8.39	84	15	50-130	30
Benzo(a)anthracene	ND	10	6.52	65	10	7.37	74	12	50-130	30
Benzo(a)pyrene	ND	10	6.69	67	10	7.43	74	11	50-130	30
Benzo(b)fluoranthene	ND	10	7.87	79	10	8.72	87	10	50-130	30
Benzo(k)fluoranthene	ND	10	5.12	51	10	5.75	58	12	30-150	30
Benzo(g,h,i)perylene	ND	10	6.43	64	10	7.22	72	12	50-130	30
Chrysene	ND	10	6.33	63	10	7.15	71	12	50-130	30
Dibenzo(a,h)anthracene	ND	10	6.58	66	10	7.33	73	11	40-140	30
Fluoranthene	ND	10	7.34	73	10	8.35	84	13	50-130	30
Fluorene	ND	10	6.53	65	10	7.52	75	14	40-130	30
Indeno(1,2,3-cd)pyrene	ND	10	6.6	66	10	7.28	73	10	30-140	30
Naphthalene	ND	10	5.65	57	10	6.38	64	12	30-130	30
Phenanthrene	ND	10	6.94	69	10	7.96	80	14	40-130	30
Pyrene	ND	10	7.21	72	10	8.25	82	13	40-130	30

SURROGATE PARAMETER	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	QC LIMIT (%)
Terphenyl-d14	10	9.32	93	10	10.7	107	50-130

3023

```

=====
Client       : SES-TECH                      Date Collected: NA
Project      : CAMP PENDLETON, UST SITE 14137 Date Received: 02/15/06
Batch No.    : 06B030A                      Date Extracted: 02/15/06 19:00
Sample ID    : MBLK1S                       Date Analyzed: 02/16/06 19:11
Lab Samp ID  : SPB002SB                     Dilution Factor: 1
Lab File ID  : RBK234                       Matrix          : WATER
Ext Btch ID  : SVB030W                     % Moisture      : NA
Calib. Ref.  : RAK026                       Instrument ID   : T-052
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
ACENAPHTHENE	ND	1	.2
ACENAPHTHYLENE	ND	1	.2
ANTHRACENE	ND	2	.2
BENZO(A)ANTHRACENE	ND	2	.2
BENZO(A)PYRENE	ND	1	.2
BENZO(B)FLUORANTHENE	ND	1	.2
BENZO(K)FLUORANTHENE	ND	2	.2
BENZO(G,H,I)PERYLENE	ND	1	.2
CHRYSENE	ND	2	.2
DIBENZO(A,H)ANTHRACENE	ND	1	.2
FLUORANTHENE	ND	2	.2
FLUORENE	ND	2	.2
INDENO(1,2,3-CD)PYRENE	ND	1	.2
NAPHTHALENE	ND	1	.2
PHENANTHRENE	ND	1	.2
PYRENE	ND	2	.2

PROBATE PARAMETERS	% RECOVERY	QC LIMIT
TERPHENYL-D14	111	50-130

RL: Reporting Limit
SPLP Extraction Date: 02/10/06 18:20

LABORATORY REPORT FOR

SES-TECH

CAMP PENDLETON, UST SITE 14137

METHOD 1312/3520C/8015B
SPLP PETROLEUM HYDROCARBONS BY EXTRACTION

SDG#: 06B030A

5000

CASE NARRATIVE

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14137
SDG: 06B030A

METHOD 1312/3520C/8015B SPLP PETROLEUM HYDROCARBONS BY EXTRACTION

Three (3) soil samples were received on 02/03/06 for SPLP Petroleum Hydrocarbons by Extraction analysis by Method 1312/3520C/8015B in accordance with SW846 3RD Edition.

1. Holding Time

Analytical holding time was met. SPLP extraction was performed on 02/10/06 and completed on 02/11/06. 3520C extraction was performed on 02/15/06 and completed on 02/16/06.

2. Calibration

Initial calibration was seven points for Diesel. %RSDs were within 20%. Continuing calibrations were carried out at 12-hour intervals and all recoveries were within 85-115%.

3. Method Blank

Method blanks were free of contamination at half of the reporting limit.

4. Surrogate Recovery

Hexacosane recovery in sample B030-03, both in the initial and re-analysis, was out of QC limit due to matrix interference; however, Bromobenzene met the QC criteria. Surrogate recovery in sample B030-07 could not be evaluated due to dilution. All others met the QC criteria.

5. Lab Control Sample/Lab Control Sample Duplicate

All recoveries were within QC limits.

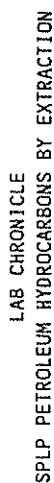
6. Matrix Spike/Matrix Spike Duplicate

No MS/MSD sample was designated in this SDG.

7. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met with the aforementioned exception. Sample results were quantitated from C10 to C24 using Diesel (C10-C24) calibration factor.

All the samples displayed diesel-like fuel pattern.

SDG NO. : 06B030A
Instrument ID : GCT050

Client : SES-TECH
Project : CAMP PENDLETON, UST SITE 14137

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	WATER		Extraction Date/Time	Sample Data FN	Calibration Prep.		Notes
				Analysis Date/Time				Data FN	Batch	
MBLK1W	DSB029WB	1	NA	02/16/0615:28		02/15/0619:00	TB16008A	TB16002A	DSB029W	Method Blank
	DSB029WL	1	NA	02/16/0621:04		02/15/0619:00	TB16016A	TB16014A	DSB029W	Lab Control Sample (LCS)
	DSB029WC	1	NA	02/16/0621:46		02/15/0619:00	TB16017A	TB16014A	DSB029W	LCS Duplicate
	SPB002SB	1	NA	02/16/0616:10		02/15/0619:00	TB16009A	TB16002A	DSB029W	Method Blank
0004-075	B030-03	1	NA	02/16/0616:52		02/15/0619:00	TB16010A	TB16002A	DSB029W	Field Sample
	B030-06	1	NA	02/16/0617:34		02/15/0619:00	TB16011A	TB16002A	DSB029W	Field Sample
	B030-07T	10	NA	02/16/0618:16		02/15/0619:00	TB16012A	TB16002A	DSB029W	Diluted Sample

```

FN      - Filename
% Moist - Percent Moisture

```

5002

SAMPLE RESULTS

METHOD 1312/3520C/8015B
SPLP PETROLEUM HYDROCARBONS BY EXTRACTION



=====
Client : SES-TECH Date Collected: 02/03/06
Project : CAMP PENDLETON, UST SITE 14137 Date Received: 02/03/06
Batch No. : 06B030A Date Extracted: 02/15/06 19:00
Sample ID: 0004-075 Date Analyzed: 02/16/06 16:52
Lab Samp ID: B030-03 Dilution Factor: 1
Lab File ID: TB16010A Matrix : WATER
Ext Batch ID: DSB029W % Moisture : NA
Calib. Ref.: TB16002A Instrument ID : GCT050
=====

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
DIESEL	5	.1	.025

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	41*	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

* : Out of QC limit due to matrix interference

5004

METHOD 1312/3520C/8015B
SPLP PETROLEUM HYDROCARBONS BY EXTRACTION



=====
Client : SES-TECH Date Collected: 02/03/06
Project : CAMP PENDLETON, UST SITE 14137 Date Received: 02/03/06
Batch No. : 06B030A Date Extracted: 02/15/06 19:00
Sample ID: 0004-078 Date Analyzed: 02/16/06 17:34
Lab Samp ID: B030-06 Dilution Factor: 1
Lab File ID: TB16011A Matrix : WATER
Ext Btch ID: DSB029W % Moisture : NA
Calib. Ref.: TB16002A Instrument ID : GCT050
=====

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
DIESEL	30	.1	.025

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	102	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

5008

METHOD 1312/3520C/8015B
SPLP PETROLEUM HYDROCARBONS BY EXTRACTION

EMAX
LABORATORY, INC.

=====

Client	: SES-TECH	Date Collected:	02/03/06
Project	: CAMP PENDLETON, UST SITE 14137	Date Received:	02/03/06
Batch No.	: 06B030A	Date Extracted:	02/15/06 19:00
Sample ID:	0004-079	Date Analyzed:	02/16/06 18:16
Lab Samp ID:	B030-07T	Dilution Factor:	10
Lab File ID:	TB16012A	Matrix	: WATER
Ext Btch ID:	DSB029W	% Moisture	: NA
Calib. Ref.:	TB16002A	Instrument ID	: GCT050

=====

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
DIESEL	34	1	.25

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	DO	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

DO : Diluted Out

5008

QC SUMMARIES

METHOD 1312/3520C/8015B
SPLP PETROLEUM HYDROCARBONS BY EXTRACTION



```

=====
Client       : SES-TECH                      Date Collected: NA
Project      : CAMP PENDLETON, UST SITE 14137 Date Received: 02/15/06
Batch No.    : 068030A                      Date Extracted: 02/15/06 19:00
Sample ID    : MBLK1W                       Date Analyzed: 02/16/06 15:28
Lab Samp ID  : DSB029WB                     Dilution Factor: 1
Lab File ID  : TB16008A                     Matrix       : WATER
Ext Btch ID  : DSB029W                      % Moisture    : NA
Calib. Ref.  : TB16002A                     Instrument ID : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
DIESEL	ND	.1	.025

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	112	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS



CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14137
BATCH NO.: 06B030A
METHOD: METHOD 1312/3520C/8015B

MATRIX: WATER % MOISTURE: NA
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK1W
LAB SAMP ID: DSB029WB DSB029WL DSB029WC
LAB FILE ID: TB16008A TB16016A TB16017A
DATE EXTRACTED: 02/15/0619:00 02/15/0619:00 02/15/0619:00 DATE COLLECTED: NA
DATE ANALYZED: 02/16/0615:28 02/16/0621:04 02/16/0621:46 DATE RECEIVED: 02/15/06
PREP. BATCH: DSB029W DSB029W DSB029W
CALIB. REF: TB16002A TB16014A TB16014A

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Diesel	ND	5	4.53	91	5	4.62	92	2	65-135	30

SURROGATE PARAMETER	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	QC LIMIT (%)
Hexacosane	.25	.288	115	.25	.287	115	65-135

METHOD 1312/3520C/8015B
SPLP PETROLEUM HYDROCARBONS BY EXTRACTION

EMAX
LABORATORIES, INC.

=====

Client	: SES-TECH	Date Collected:	NA
Project	: CAMP PENDLETON, UST SITE 14137	Date Received:	02/15/06
Batch No.	: 06B030A	Date Extracted:	02/15/06 19:00
Sample ID:	MBLK1S	Date Analyzed:	02/16/06 16:10
Lab Samp ID:	SPB002SB	Dilution Factor:	1
Lab File ID:	TB16009A	Matrix	: WATER
Ext Btch ID:	DSB029W	% Moisture	: NA
Calib. Ref.:	TB16002A	Instrument ID	: GCT050

=====

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
DIESEL	ND	.1	.025

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	107	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

APPENDIX D

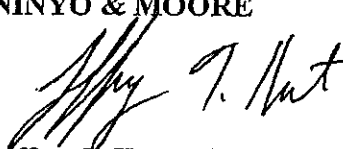
EXCAVATION COMPACTION REPORT

LIMITATIONS


The geotechnical services outlined in this report have been conducted in accordance with current practice and the standard of care exercised by geotechnical consultants performing similar tasks in this area. No warranty, expressed or implied, is made regarding the observations and conclusions expressed in this report. The reported test results represent the relative compaction and moisture content at the locations tested. It is important to note that the precision of field density tests and the modified Proctor dry density tests is not exact and variations should be expected. The reported locations and depths of the density tests are estimated based on correlations with the site surroundings. Further accuracy is not implied.

We appreciate the opportunity to be of service on this project. Should you have any questions related to this report, please contact the undersigned.

Sincerely,
NINYO & MOORE


Jeffrey T. Kent, P.E.
Project Engineer




Mark Cuthbert, P.E.
Principal Engineer

DLP/JTK/MC/ag/gg

Distribution: (2) Addressee

Attachments: Table 1 – Summary of Field Density Tests
Table 2 – Modified Proctor Density Test Results
Table 3 – Expansion Index Test Results

SUMMARY OF FIELD DENSITY TESTS

PROJECT NO. 105796001

TABLE 1

TEST OF: COMPACTED FILL

Test No.	Test of	Date	Test Location	Depth (ft)	Soil Type No.	Wet Density (pcf)	Field Moisture (%)	Dry Density (pcf)	Proctor Density (pcf)	Optimum Moisture Content (%)	Relative Compaction (%)	Specified Compaction (%)	Remarks
1#	CF	2/1/06	Building 1441	5.0	1	127.0	9.3	116.2	122.0	11.5	95	90 - 95	
2*	CF	2/1/06	Building 1441	5.0	1	124.6	8.5	114.8	122.0	11.5	94	90 - 95	
3#	CF	2/1/06	Building 1441	4.0	1	131.9	12.2	117.6	122.0	11.5	96	90 - 95	
4#	CF	2/1/06	Building 1441	3.0	1	133.1	10.2	120.8	122.0	11.5	99	90 - 95	
5#	CF	2/1/06	Building 1441	2.0	1	130.9	9.1	120.0	122.0	11.5	98	90 - 95	
6#	CF	2/1/06	Building 1441	1.0	1	124.2	9.6	113.3	122.0	11.5	93	90 - 95	
7#	CF	2/1/06	Building 1441	1.0	1	129.3	11.2	116.3	122.0	11.5	95	90 - 95	
8#	CF	2/1/06	Building 1441	0.0	1	125.8	9.9	114.5	122.0	11.5	94	90 - 95	
9#	CF	2/1/06	Building 1441	0.0	1	129.6	10.9	116.9	122.0	11.5	96	90 - 95	
10#	CF	2/3/06	Building 14137	5.0	1	124.0	9.9	112.8	122.0	11.5	92	90 - 95	
11#	CF	2/3/06	Building 14137	5.0	1	129.8	11.8	116.1	122.0	11.5	95	90 - 95	
12#	CF	2/3/06	Building 14137	4.0	1	126.8	12.1	113.1	122.0	11.5	93	90 - 95	
13#	CF	2/3/06	Building 14137	4.0	1	130.7	12.0	116.7	122.0	11.5	96	90 - 95	
14#	CF	2/3/06	Building 14137	3.0	1	130.0	10.9	117.3	122.0	11.5	96	90 - 95	
15#	CF	2/3/06	Building 14137	2.0	1	130.1	10.1	118.2	122.0	11.5	97	90 - 95	
16#	CF	2/3/06	Building 14137	1.0	1	130.4	10.6	117.9	122.0	11.5	97	90 - 95	
17*	CF	2/3/06	Building 14137	3.0	1	123.9	9.1	113.6	122.0	11.5	93	90 - 95	
18*	CF	2/7/06	Building 14131	5.0	1	132.4	10.6	119.7	122.0	11.5	98	90 - 95	
19*	CF	2/7/06	Building 14131	4.0	1	129.8	10.4	117.6	122.0	11.5	96	90 - 95	
20#	CF	2/7/06	Building 14131	3.0	1	131.8	10.5	119.3	122.0	11.5	98	90 - 95	
21#	CF	2/7/06	Building 14131	2.0	1	131.1	14.8	114.2	122.0	11.5	94	90 - 95	
22#	CF	2/7/06	Building 14131	2.0	1	133.8	12.1	119.4	122.0	11.5	98	90 - 95	
23#	CF	2/7/06	Building 14131	1.0	1	132.8	9.7	121.1	122.0	11.5	99	90 - 95	
24#	CF	2/7/06	Building 14131	0.0	1	133.5	10.1	121.3	122.0	11.5	99	90 - 95	
Average Relative Compaction =											96	95	

* Test performed by Nuclear Gauge method (ASTM D2922 and D3017)

* Test performed by Sand Cone method (ASTM D 1556)

Table 2 – Modified Proctor Density Test Results

Soil Type No.	Description	Dry Density (pcf)	Optimum Moisture Content (%)
1	Grayish Brown Clayey SAND	122.0	11.5

Table 3 – Expansion Index Test Results

Soil Type No.	Expansion Index	Expansion Index	Specification
1	Very Low	16	<20

APPENDIX E

**LABORATORY ANALYTICAL REPORTS, FIELD SAMPLING LOGS,
AND NON-HAZARDOUS MATERIAL HAULING MANIFESTS FOR
WELL INSTALLATION AND MARCH 2006 GROUNDWATER
SAMPLING EVENT**

Date: 3/14/06 Project Name: UST site 14137
Personnel: WA, JS Project OFS: 2973.0040
Weather: Sunny Measurement Device: Solinist
Comments: _____

[illegible]

Project Name: <u>UST Site 1437</u>	Well Number: <u>MW1</u>
Project Number: <u>2973.0040</u>	Equipment: <u>Honiba U-22</u>
Date: <u>3/14/06</u>	Sample ID: <u>0004-120</u> Time: <u>1119</u>
Site Engineer(s): <u>WBS JS</u>	Contractor: <u>None</u>

Total Volume Purged (mL): 1200

$$= (2.4)(16) + 470$$

System Volume (mL) = (2.4*H)+470
 where
 2.4mL/ft = tubing volume per foot (1/8" I.D.)
 H = length of tubing in feet
 470 mL = Bladder volume + Flowthru cell volume

Hach Fe²⁺ NA

Revised Low-flow log (CPEN) SES-TECH

Page 1 of 1

Project Name: UST site 14137

Well Number: 14422

Project Number: 2073.0040

Equipment: Horiba 17-22

Date: 3/14/06

Sample ID: 0004-121 Time: 1200

Site Engineer(s): WB ST

Contractor:

Reference: Top of Casing

Before After

Total Volume Purged (mL): 166

Depth to Water (ft)

7.36	7.62
------	------

Depth of Well (ft)

24.124

Depth to Top of Screen (ft)

51

Screen Length (ft)

10

Pump Depth (ft)

11

Pump Rate

100 my min

Sample Pump Rate

100 mL / 100 mL

System Volume (mL)

496

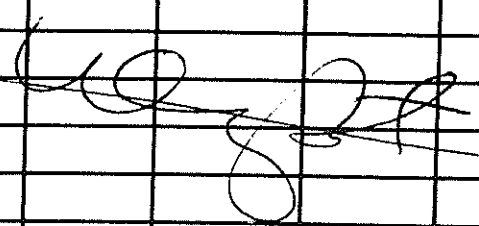
$$496 = (2.4)(11) + 470$$
$$\text{System Volume (mL)} = (2.4 \cdot H) + 470$$

where

2.4mL/ft = tubing volume per foot (1/8" I.D.)

H = length of tubing in feet

$$470 \text{ mL} = \text{Bladder volume} + \text{Flowthru cell volume}$$

Time	pH	Conductivity (umhos)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mv)	Turbidity (NTU)	Depth to Water (ft)	Cum. Volume (mL)	Comments
1142	—	—	—	—	—	—	—	—	pump on
1145	7.07	1820	0.24	20.33	-65	40.9	7.42	300	
1148	7.06	1820	0.12	20.34	-66	42.3	7.48	600	
1151	7.05	1830	0.09	20.34	-66	41.9	7.51	900	
1154	7.08	1830	0.00	20.34	-69	36.8	7.54	1200	
1157	7.15	1830	0.00	20.33	-73	38.9	7.58	1500	
1200	7.18	1830	0.00	20.33	-75	37.1	7.62	1800	
1203	—	—	—	—	—	—	—	—	stable collect sample
1206	—	—	—	—	—	—	—	—	
									
Stability:	± 0.2 units	± 5 %	± 0.2 mg/L	± 3 %	± 20 mV	± 10 %			

Hach Fe²⁺ 11A

Samples were collected directly from pump unless otherwise noted.

LOW-FLOW PURGING AND SAMPLING DATA SHEET

Project Name: UST Site 14137
 Project Number: 2973.0040
 Date: 3/14/06
 Site Engineer(s): W.B. US

Well Number: New 3
 Equipment: Horiba U-22
 Sample ID: 0004-123 Time: 1406
 Contractor: None

Reference: Top of Casing Before After

Total Volume Purged (mL): 1800

Depth to Water (ft) 7.76 8.05
 Depth of Well (ft) 23.9
 Depth to Top of Screen (ft) 18
 Screen Length (ft) 20-10 up
 Pump Depth (ft) ~10
 Pump Rate 100 mL/min
 Sample Pump Rate 100 mL/min
 System Volume (mL) 508

$$508 = (2.4)(16) + 470$$

$$\text{System Volume (mL)} = (2.4 \times H) + 470$$

where

2.4 mL/ft = tubing volume per foot (1/8" I.D.)

H = length of tubing in feet

470 mL = Bladder volume + Flowthru cell volume

Time	pH	Conductivity (umhos)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mv)	Turbidity (NTU)	Depth to Water (ft)	Cum. Volume (mL)	Comments
1342									
1345	7.12	1080	0.40	18.68	40	26.8	7.91	300	pump on
1348	7.15	1080	0.00	18.66	39	29.4	7.86	600	
1351	7.6	1080	0.00	18.63	37	33.6	7.93	900	
1354	7.16	1070	0.00	18.63	32	32.8	7.97	1200	
1357	7.18	1070	0.00	18.63	29	32.4	8.00	1500	
1400	7.17	1070	0.00	18.62	27	32.2	8.05	1800	
1403									stable
1406									collect sample
W.B. US									
Stability:	± 0.2 units	± 5%	± 0.2 mg/L	± 3%	± 20 mV	± 10%			

Hach Fe²⁺ N/A

Samples were collected directly from pump unless otherwise noted.

Project Name: <u>UST Site 14137</u>	Well Number: <u>MW5</u>
Project Number: <u>2973 0040</u>	Equipment: <u>Hariba U-22</u>
Date: <u>3/14/06</u>	Sample ID: <u>0004-122</u> Time: <u>1311</u>
Site Engineer(s): <u>WJ2, JS</u>	Contractor: <u>None</u>

Total Volume Purged (mL): 1800

$$496 = (2.4)(11) + 470$$
$$\text{System Volume (mL)} = (2.4 \cdot H) + 470$$

where

2.4mL/ft = tubing volume per foot (1/8" I.D.)

H = length of tubing in feet

$$470 \text{ mL} = \text{Bladder volume} + \text{Flowthru cell volume}$$
[illegible]

Hach Fe²⁺ UA

Samples were collected directly from pump unless otherwise noted.

LOW-FLOW PURGING AND SAMPLING DATA SHEET

Project Name: <u>UST Site 14137</u>	Well Number: <u>MW-6</u>
Project Number: <u>2973.0040</u>	Equipment: <u>Horiba U-22</u>
Date: <u>3/14/06</u>	Sample ID: <u>0004-119</u> Time: <u>1027</u>
Site Engineer(s): <u>WJ JS</u>	Contractor: <u>Dme</u>

Reference: Top of Casing Before After

Total Volume Purged (mL): 1800

Depth to Water (ft)	<u>16.90</u>
Depth of Well (ft)	<u>14.3</u>
Depth to Top of Screen (ft)	<u>4.3</u>
Screen Length (ft)	<u>10</u>
Pump Depth (ft)	<u>11</u>
Pump Rate	<u>100 mL/min</u>
Sample Pump Rate	<u>100 mL/min</u>
System Volume (mL)	<u>496</u>

$$496 = (2.4 \times 11) + 470$$

$$\text{System Volume (mL)} = (2.4 \times H) + 470$$

where

2.4 mL/ft = tubing volume per foot (1/8" I.D.)

H = length of tubing in feet

470 mL = Bladder volume + Flowthru cell volume

Time	pH	Conductivity (umhos)	Dissolved Oxygen (mg/L)	Temp. (°C)	ORP (mv)	Turbidity (NTU)	Depth to Water (ft)	Cum. Volume (mL)	Comments
1003									
1006	7.41	1520	0.40	16.68	120	12.9	7.05	300	sample cloudy, 10 min
1009	7.41	1520	0.33	16.68	119	13.2	7.14	600	
1012	7.44	1520	0.21	16.68	116	14.2	7.20	900	
1015	7.45	1520	0.20	16.67	115	14.6	7.25	1200	
1018	7.46	1520	0.18	16.67	114	15.0	7.38	1500	
1021	7.46	1520	0.16	16.67	111	16.3	7.42	1800	
1024									stable
1027									collected sample
<i>[Handwritten signature]</i>									
Stability:	± 0.2 units	± 5 %	± 0.2 mg/L	± 3 %	± 20 mV	± 10 %			

Hach Fe²⁺ N/A

Samples were collected directly from pump unless otherwise noted.

Page 1 of 1

Project Name: UST site 1437
Project Number: 2973.0040
Date: 3/14/06
Site Engineer(s): WJB STJS

Well Number: MW-7
Equipment: Horiba U-22
Sample ID: 0004-124/25 Time: 15:29
Contractor: None

Before After

Total Volume Purged (mL): 800

7.93	8.04
------	------

14.8

5

10

12

100 ^{mL} min

100 m4min

995

$$(2.4)(12) + 470 = 499$$

System Volume (mL) = (2.4*H)+470
where

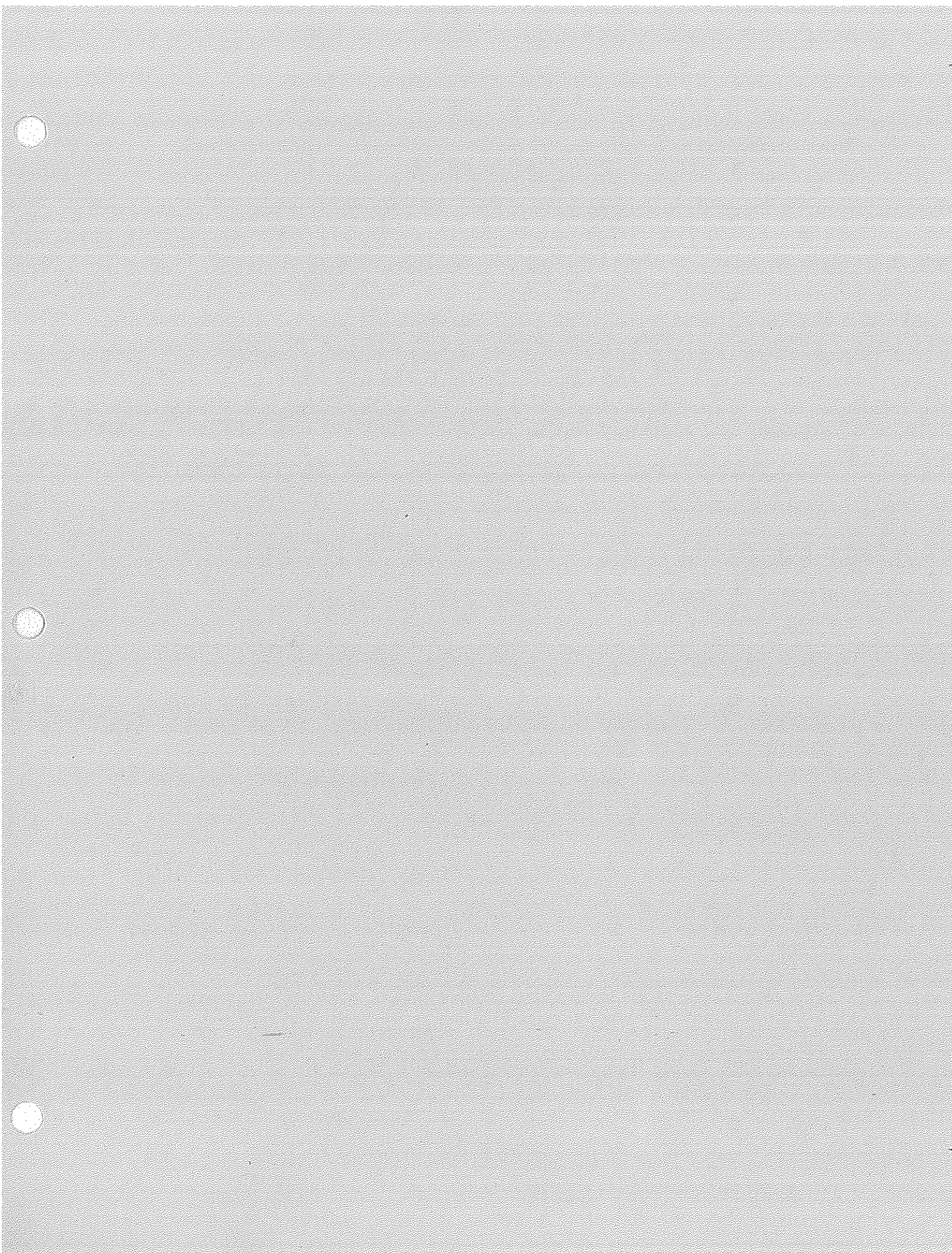
2.4mL/ft = tubing volume per foot (1/8" I.D.)

H = length of tubing in feet

$$470 \text{ mL} = \text{Bladder volume} + \text{Flowthru cell volume}$$
[illegible]

Hoch Fe^{2+}	n	A
-----------------------	---	---

Samples were collected directly from pump unless otherwise noted.



NON-HAZARDOUS WASTE MANIFEST

Please print or type (Form designed for use on elite (12 pitch) typewriter)

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.

CA 2170023533

Manifest Document No.

60190

2. Page 1 of

3. Generator's Name and Mailing Address

~~Poster Wheeler~~ MCB Camp Pendleton

~~Tetra Tech Inc. 1230 Columbia Street Suite 500~~

~~San Diego, CA 92101~~ PO Box 555008, Camp Pendleton, CA 92055

4. Generator's Phone (760-725-)

Attn: ~~Not a~~ 92055

5. Transporter 1 Company Name

General Environmental Mgmt Inc.

US EPA ID Number

CAD983649880

A. State Transporter's ID

B. Transporter 1 Phone

800-326-1011

C. State Transporter's ID

D. Transporter 2 Phone

E. State Facility's ID

F. Facility's Phone

619-696-6201

9. Designated Facility Name and Site Address

Candelaria Environmental

4001 Candelaria Lane

Anza, CA 92539

10. US EPA ID Number

US ECOLOGY NVT330010000

HWY 95, 11 MILES S. OF BEATTY
BEATTY, NV 89003

11. WASTE DESCRIPTION

a. Non hazardous solid (Soil)

12. Containers

No.

Type

13. Total Quantity

14. Unit
WL/Vo

23

D M

13.800
12.800
Est -

G. Additional Descriptions for Materials Listed Above

11a) x55g-Approval#

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information

Emergency Phone: (800) 326-1011 (G.E.M.)

Site: Assistant Chief of Staff-Bldg#22165 Assistant Chief, Camp Pendleton, CA 92055

Ust sites 52710, 2389, (14131), 14137

16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.

Printed/Typed Name

Margo Williams

Signature

Margo Williams

Date

Month Day Year

4/20/06

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

JOSE T VASQUEZ

Signature

Jose T Vasquez

Date

Month Day Year

04/20/06

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Date

Month Day Year

19. Discrepancy Indication Space

20. Facility Owner or Operator; Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name

Signature

Date

Month Day Year

NON-HAZARDOUS WASTE MANIFEST

Please print or type (Form designed for use on elite (12 pitch) typewriter)

NON-HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.

CA 2170023533

Manifest Document No.

60189

2. Page of

3. Generator's Name and Mailing Address

~~Tetra Tech Inc.~~ MCB Camp Pendleton
1236 Columbia Street, Suite 500
San Diego, CA 92101 PO Box 555008, Camp Pendleton, CA 92055

4. Generator's Phone (760-725-0289

Attn: ~~Steve Dutton~~ Chief of Staff

5. Transporter 1 Company Name

General Environmental Mgmt Inc.

US EPA ID Number CAD983649880

A. State Transporter's ID

B. Transporter 1 Phone 800-326-10

C. State Transporter's ID

D. Transporter 2 Phone

E. State Facility's ID

F. Facility's Phone

909-476-230

7. Transporter 2 Company Name

US EPA ID Number

9. Designated Facility Name and Site Address

K-Pure
8910 Rochester Avenue
Rancho Cucamonga, CA 91730

10. US EPA ID Number

11. WASTE DESCRIPTION

a. Non hazardous liquid (Well Water)

12. Containers

No.

Type

13. Total Quantity

14. Unit Wt./V

5

DM

EST
250

G. Additional Descriptions to: Materials Listed Above

11a) 5 x55g-Approval#

H. Handling Codes for Wastes Listed Above

15. Special Handling Instructions and Additional Information

Emergency Phone: (800) 326-1011 (G.E.M.)

Site: Assistant Chief of Staff-Bldg #22165-Assistant Chief, Camp Pendleton, CA 92055

UST Site 52710, 2389, (14131) 14137, 1133, 21454/533, 1791

16. GENERATOR'S CERTIFICATION: I hereby certify that the contents of this shipment are fully and accurately described and are in all respects in proper condition for transport. The materials described on this manifest are not subject to federal hazardous waste regulations.

Printed/Typed Name

Margo Williams

Signature

Margo Williams

Date

Month Day Year
4/20/06

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name

JOSE T VASQUEZ

Signature

Jose T Vasquez

Date

Month Day Year
09/20/08

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name

Signature

Month Day Year

19. Discrepancy Indication Space

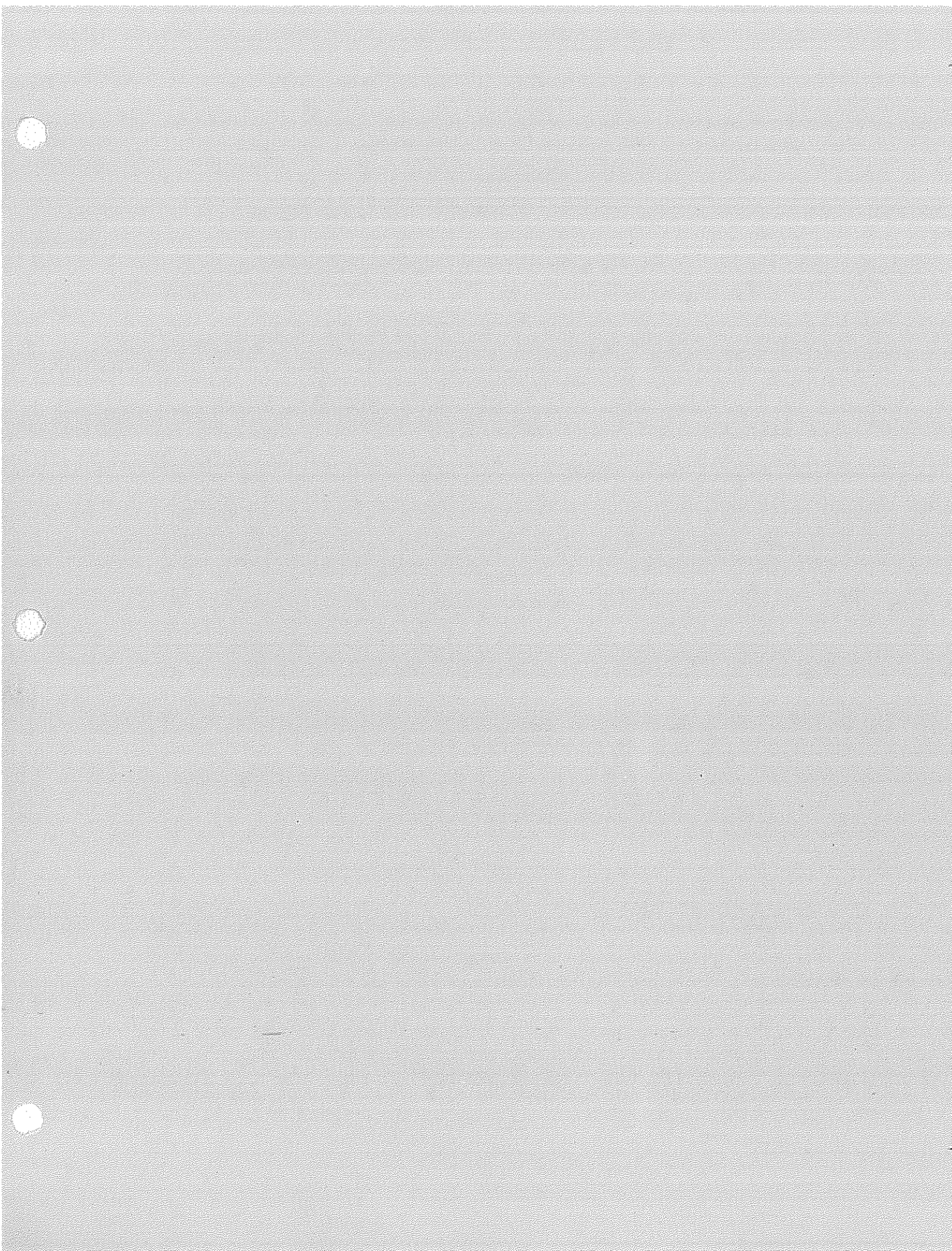
20. Facility Owner or Operator, Certification of receipt of the waste materials covered by this manifest, except as noted in item 19.

Printed/Typed Name

Signature

Date

Month Day Year





LABORATORIES, INC.

1835 W. 205th Street
Torrance, CA 90501
Tel: (310) 618-8889
Fax: (310) 618-0818

Date: 03-27-2006
EMAX Batch No.: 06C140

Attn: Nick Weinberger

SES-TECH
1940 E. Deere Avenue, Suite 200
Santa Ana CA 92705

Subject: Laboratory Report
Project: Camp Pendleton, UST Site 14137

Enclosed is the Laboratory report for samples received on 03/15/06.
The data reported include :

Sample ID	Control #	Col Date	Matrix	Analysis
0004-118	C140-01	03/14/06	WATER	VOLATILE ORGANICS BY GC/MS
0004-119	C140-02	03/14/06	WATER	VOLATILE ORGANICS BY GC/MS TPH DIESEL SEMIVOLATILE ORGANICS SIM
0004-120	C140-03	03/14/06	WATER	VOLATILE ORGANICS BY GC/MS TPH DIESEL SEMIVOLATILE ORGANICS SIM
0004-121	C140-04	03/14/06	WATER	VOLATILE ORGANICS BY GC/MS TPH DIESEL SEMIVOLATILE ORGANICS SIM
0004-122	C140-05	03/14/06	WATER	VOLATILE ORGANICS BY GC/MS TPH DIESEL SEMIVOLATILE ORGANICS SIM
0004-123	C140-06	03/14/06	WATER	VOLATILE ORGANICS BY GC/MS TPH DIESEL SEMIVOLATILE ORGANICS SIM
0004-124	C140-07	03/14/06	WATER	VOLATILE ORGANICS BY GC/MS TPH DIESEL SEMIVOLATILE ORGANICS SIM

Sample ID	Control #	Col Date	Matrix	Analysis
0004-125	C140-08	03/14/06	WATER	VOLATILE ORGANICS BY GC/MS TPH DIESEL SEMIVOLATILE ORGANICS SIM
0004-126	C140-09	03/14/06	WATER	VOLATILE ORGANICS BY GC/MS TPH DIESEL SEMIVOLATILE ORGANICS SIM
0004-123MS	C140-06M	03/14/06	WATER	VOLATILE ORGANICS BY GC/MS TPH DIESEL SEMIVOLATILE ORGANICS SIM
0004-123MSD	C140-06S	03/14/06	WATER	VOLATILE ORGANICS BY GC/MS TPH DIESEL SEMIVOLATILE ORGANICS SIM

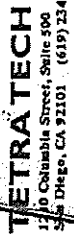
The results are summarized on the following pages.

Please feel free to call if you have any questions concerning these results.

Sincerely yours,

K. Y. Pang

Kam Y. Pang, Ph.D.
Laboratory Director



CHAIN-OF-CUSTODY RECORD

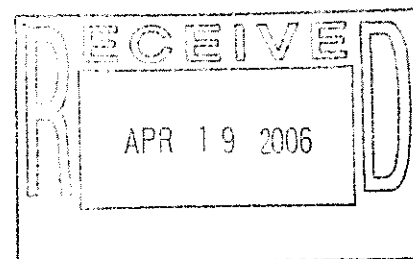
PROJECT NAME	Camp Pendleton	PURCHASE ORDER NO.	056080
PROJECT LOCATION	OST 14137	PROJECT NO.	2973.0040
SAMPLER NAME	Wendy Bryant	AIRBILL NUMBER	1911
PROJECT CONTACT	Nick Weinberger	PROJECT CONTACT PHONE NUMBER	441-56-7588

SAMPLE ID	DATE COLLECTED	TIME COLLECTED	NO. OF CONTAINER	LEVEL		T TYPE	T A T	T H P H	T H P H	COMMENTS	LOCATION	DEPTH		QC
				3	4							START	END	
0004-118	3/14/06	1000	3	X		W Day		X	3/14/06		TRIP Blank			TB
0004-119	3/14/06	1027	5	X		W Day		X			MW6			Reg
0004-120	3/14/06	1119	5	X		W Day		X			MW1			Reg
0004-121	3/14/06	1200	5	X		W Day		X			MW2			Reg
0004-122	3/14/06	1311	5	X		W Day		X			MW5			Reg
0004-123	3/14/06	1406	15	X		W Day		X		MS/MSD	MW3			Reg
0004-124	3/14/06	1529	5	X		W Day		X			MW7			Reg
0004-125	3/14/06	1534	5	X		W Day		X			MW7			Reg
0004-126	3/14/06	1555	5	X		W Day		X			Equip Ring			Reg
RELINQUISHED BY (Signature) <u>[Signature]</u> DATE <u>3/15/06</u> TIME <u>1700</u> COMPANY <u>EMVAX</u>														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____ COMPANY _____														
RELINQUISHED BY (Signature) _____ DATE _____ TIME _____														

White - Laboratory; Pink - Laboratory; Canary - Project File; Manila - Data Management

COPY

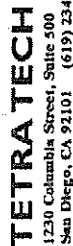
TABLE OF CONTENTS



CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14137
SDG: 06C140

SECTION	PAGE
Cover Letter, COC/Sample Receipt Form	1000 – 1004
GC/MS-VOA METHOD 5030B/8260B	2000 – 2130
GC/MS-SVOA METHOD 3520C/8270C SIM	3000 – 3082
GC-VOA **	4000 –
GC-SVOA METHOD 3520C/8015B	5000 – 5058
HPLC **	6000 –
METALS **	7000 –
WET **	8000 –
OTHERS **	9000 –

** - Not Requested



TETRA TECH
1230 Columbia Street, Suite 500
San Diego, CA 92101 (619) 234-XXXX

NUMBER 20345

CHAIN-OF-CUSTODY RECORD

San Diego, CA 92101 (619) 234-8696

DS/V601-43

PROJECT NAME		PURCHASE ORDER NO		ANALYSES REQUIRED		LABORATORY NAME	
PROJECT LOCATION		PROJECT NO		LABORATORY ID (FOR LABORATORY)		COMMENTS	
SAMPLER NAME		AIRBILL NUMBER		PROJECT CONTACT PHONE NUMBER			
PROJECT CONTACT		PROJECT CONTACT PHONE NUMBER					
SAMPLE ID	DATE COLLECTED	TIME COLLECTED	NO OF CONTAINER	LEVEL	TYP	DATE	
				3 4	TYP	DATE	
0004-118	3/14/06	1000	3	X	W	10 Day	
0004-119	3/14/06	1027	5	X	W	10 Day	
0004-120	3/14/06	1119	5	X	W	10 Day	
0004-121	3/14/06	1206	5	X	W	10 Day	
0004-122	3/14/06	1311	5	X	W	10 Day	
0004-123	3/14/06	1406	15	X	W	10 Day	
0004-124	3/14/06	1529	5	X	W	10 Day	
0004-125	3/14/06	1534	5	X	W	10 Day	
0004-126	3/14/06	1555	5	X	W	10 Day	
RELINQUISHED BY (Signature)		RECEIVED BY (Signature)		LABORATORY INSTRUCTIONS/COMMENTS			
DATE		DATE					
TIME		TIME					
COMPANY		COMPANY					
RELINQUISHED BY (Signature)		RECEIVED BY (Signature)		COMPOSITE DESCRIPTION			
DATE		DATE					
TIME		TIME					
COMPANY		COMPANY					
RELINQUISHED BY (Signature)		RECEIVED BY (Signature)		SAMPLE CONDITION UPON RECEIPT (FOR LABORATORY)			
DATE		DATE		TEMPERATURE: 2.2°C			
TIME		TIME		COOLER SEAL: 2.2°C			
COMPANY		COMPANY		SAMPLE CONDITION: <input type="checkbox"/> IMPACT <input type="checkbox"/> BROKEN			
				COOLER SEAL: <input type="checkbox"/> INTACT <input type="checkbox"/> BROKEN			

White - Laboratory: Pink - Laboratory: Canary - Project File: Manila - Data Management

517157A
LABORATORY, INC.

REPORTING CONVENTIONS

DATA QUALIFIERS:

Lab Qualifier	AFCEE Qualifier	Description
J	F	Indicates that the analyte is positively identified and the result is less than RL but greater than MDL.
N		Indicates presumptive evidence of a compound.
B	B	Indicates that the analyte is found in the associated method blank as well as in the sample at above QC level.
E	J	Indicates that the result is above the maximum calibration range.
*	*	Out of QC limit.

Note: The above qualifiers are used to flag the results unless the project requires a different set of qualification criteria.

ACRONYMS AND ABBREVIATIONS:

CRDL	Contract Required Detection Limit
RL	Reporting Limit
MRL	Method Reporting Limit
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
DO	Diluted out

DATES

The date and time information for leaching and preparation reflect the beginning date and time of the procedure unless the method, protocol, or project specifically requires otherwise.

LABORATORY REPORT FOR

SES-TECH

CAMP PENDLETON, UST SITE 14137

METHOD 5030B/8260B
VOLATILE ORGANICS BY GC/MS

SDG#: 06C140

CASE NARRATIVE

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14137
SDG: 06C140

METHOD 5030B/8260B VOLATILE ORGANICS BY GC/MS

Nine (9) water samples were received on 03/15/06 for Volatile Organic analysis by Method 5030B/8260B in accordance with USEPA SW846, 3rd ed.

1. Holding Time

Analytical holding time was met.

2. Tuning and Calibration

Tuning and calibration were carried out at 12-hour interval. All QC requirements were met.

3. Method Blank

Method blanks were free of contamination at half of the reporting limit.

4. Surrogate Recovery

Recoveries were within QC limit.

5. Lab Control Sample/Lab Control Sample Duplicate

Recoveries were within QC limit.

6. Matrix Spike/Matrix Spike Duplicate

Sample C140-06 was spiked. All recoveries were within QC limit.

7. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

LAB CHRONICLE
VOLATILE ORGANICS BY GC/MS

LABORATORY, INC.

SDG NO. : 06C140
Instrument ID : I-067

Client : SES-TECH
Project : CAMP PENDLETON, UST SITE 14137

WATER									
Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis DateTime	Extraction DateTime	Sample Data FN	Calibration Data FN	Prep. Batch	Notes
M8LK1W	V067C20Q	1	NA	03/16/0615:48	03/16/0615:48	RCC325	RCC192	V067C20	Method Blank
LCS1W	V067C20L	1	NA	03/16/0612:51	03/16/0612:51	RCC321	RCC192	V067C20	Lab Control Sample (LCS)
LCD1W	V067C20C	1	NA	03/16/0614:02	03/16/0614:02	RCC323	RCC192	V067C20	LCS Duplicate
0004-118	C140-01	1	NA	03/16/0620:32	03/16/0620:32	RCC333	RCC192	V067C20	Field Sample
0004-123	C140-06	1	NA	03/16/0621:07	03/16/0621:07	RCC334	RCC192	V067C20	Field Sample
0004-123MS	C140-06M	1	NA	03/16/0622:54	03/16/0622:54	RCC337	RCC192	V067C20	Matrix Spike Sample (MS)
0004-123MSD	C140-06S	1	NA	03/16/0623:30	03/16/0623:30	RCC338	RCC192	V067C20	MS Duplicate (MSD)
M8LK2W	V067C27Q	1	NA	03/21/0602:06	03/21/0602:06	RCC409	RCC192	V067C27	Method Blank
LCS2W	V067C27L	1	NA	03/21/0600:20	03/21/0600:20	RCC406	RCC192	V067C27	Lab Control Sample (LCS)
LCD2W	V067C27C	1	NA	03/21/0600:56	03/21/0600:56	RCC407	RCC192	V067C27	LCS Duplicate
0004-119	C140-02	1	NA	03/21/0603:53	03/21/0603:53	RCC412	RCC192	V067C27	Field Sample
0004-120	C140-03	1	NA	03/21/0604:28	03/21/0604:28	RCC413	RCC192	V067C27	Field Sample
0004-121	C140-04	1	NA	03/21/0605:04	03/21/0605:04	RCC414	RCC192	V067C27	Field Sample
0004-122	C140-05	1	NA	03/21/0605:39	03/21/0605:39	RCC415	RCC192	V067C27	Field Sample
0004-124	C140-07	1	NA	03/21/0606:15	03/21/0606:15	RCC416	RCC192	V067C27	Field Sample
0004-125	C140-08	1	NA	03/21/0606:50	03/21/0606:50	RCC417	RCC192	V067C27	Field Sample
0004-126	C140-09	1	NA	03/21/0607:25	03/21/0607:25	RCC418	RCC192	V067C27	Field Sample

FN - Filename
% Moist - Percent Moisture

SAMPLE RESULTS

SW 50308/82608
VOLATILE ORGANICS BY GC/MS

=====
Client : SES-TECH Date Collected: 03/14/06
Project : CAMP PENDLETON, UST SITE 14137 Date Received: 03/15/06
No. : 06C140 Date Extracted: 03/16/06 20:32
e ID: 0004-118 Date Analyzed: 03/16/06 20:32
Lab Samp ID: C140-01 Dilution Factor: 1
Lab File ID: RCC333 Matrix : WATER
Ext Btch ID: V067C20 % Moisture : NA
Calib. Ref.: RCC192 Instrument ID : T-067
=====

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	5	.2
1,1,2,2-TETRACHLOROETHANE	ND	1	.2
1,1,2-TRICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHENE	ND	5	.2
1,2-DICHLOROETHANE	ND	.5	.2
1,2-DICHLOROPROPANE	ND	5	.2
METHYL ETHYL KETONE	ND	50	.2
2-HEXANONE	ND	50	5
4-METHYL-2-PENTANONE (MIBK)	ND	50	5
ACETONE	ND	50	5
BENZENE	ND	.5	.2
BROMODICHLOROMETHANE	ND	5	.2
BROMOFORM	ND	5	.3
BROMOMETHANE	ND	5	.2
CARBON TETRACHLORIDE	ND	.5	.2
CHLOROBENZENE	ND	5	.2
CHLOROETHANE	ND	5	.2
CHLOROFORM	ND	5	.2
CHLOROMETHANE	ND	5	.2
CIS-1,2-DICHLOROETHENE	ND	5	.2
CIS-1,3-DICHLOROPROPENE	ND	.5	.2
DIBROMOCHLOROMETHANE	ND	5	.2
BENZENE	ND	.5	.2
YES	ND	5	.2
MIBK	ND	1	.2
METHYLENE CHLORIDE	ND	5	.5
STYRENE	ND	5	.2
TETRACHLOROETHYLENE	ND	5	.2
TOLUENE	ND	.5	.2
TRANS-1,2-DICHLOROETHENE	ND	5	.2
TRANS-1,3-DICHLOROPROPENE	ND	.5	.2
TRICHLOROETHENE	ND	5	.2
VINYL ACETATE	ND	50	.5
VINYL CHLORIDE	ND	.5	.2
TERT-BUTYL ALCOHOL	ND	20	5
DIISOPROPYL ETHER	ND	5	.2
ETHYL TERT-BUTYL ETHER	ND	5	.2
TERT-AMYL METHYL ETHER	ND	5	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	99	65-135
TOLUENE-D8	104	75-125
BROMOFLUOROBENZENE	115	75-125

R.L. : Reporting limit
* : Out of QC
E : Exceeded calibration range
B : Found in associated method blank
J : Value between R.L. and MDL
D : Value from dilution analysis
D.O. : Diluted out

=====

Client : SES-TECH	Date Collected: 03/14/06
Project : CAMP PENDLETON, UST SITE 14137	Date Received: 03/15/06
Batch No. : 06C140	Date Extracted: 03/21/06 03:53
Sample ID: 0004-119	Date Analyzed: 03/21/06 03:53
Lab Samp ID: C140-02	Dilution Factor: 1
Lab File ID: RCC412	Matrix : WATER
Ext Btch ID: VO67C27	% Moisture : NA
Calib. Ref.: RCC192	Instrument ID : T-067

=====

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	5	.2
1,1,2,2-TETRACHLOROETHANE	ND	1	.2
1,1,2-TRICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHENE	ND	5	.2
1,2-DICHLOROETHANE	ND	.5	.2
1,2-DICHLOROPROPANE	ND	5	.2
METHYL ETHYL KETONE	ND	50	.2
2-HEXANONE	ND	50	5
4-METHYL-2-PENTANONE (MIBK)	ND	50	5
ACETONE	ND	50	5
BENZENE	ND	.5	.2
BROMODICHLOROMETHANE	ND	5	.2
BROMOFORM	ND	5	.3
BROMOMETHANE	ND	5	.2
CARBON TETRACHLORIDE	ND	.5	.2
CHLOROBENZENE	ND	5	.2
CHLOROETHANE	ND	5	.2
CHLOROFORM	ND	5	.2
CHLOROMETHANE	ND	5	.2
CIS-1,2-DICHLOROETHENE	ND	5	.2
CIS-1,3-DICHLOROPROPENE	ND	.5	.2
DIBROMOCHLOROMETHANE	ND	5	.2
ETHYLBENZENE	ND	.5	.2
XYLENES	ND	5	.2
MTBE	ND	1	.2
METHYLENE CHLORIDE	ND	5	.5
STYRENE	ND	5	.2
TETRACHLOROETHYLENE	ND	5	.2
TOLUENE	ND	.5	.2
TRANS-1,2-DICHLOROETHENE	ND	5	.2
TRANS-1,3-DICHLOROPROPENE	ND	.5	.2
TRICHLOROETHENE	ND	5	.2
VINYL ACETATE	ND	50	.5
VINYL CHLORIDE	ND	.5	.2
TERT-BUTYL ALCOHOL	ND	20	5
DIISOPROPYL ETHER	ND	5	.2
ETHYL TERT-BUTYL ETHER	ND	5	.2
TERT-AMYL METHYL ETHER	ND	5	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	98	65-135
TOLUENE-D8	102	75-125
BROMOFLUOROBENZENE	109	75-125

R.L. : Reporting limit
 * : Out of QC
 E : Exceeded calibration range
 B : Found in associated method blank
 J : Value between R.L. and MDL
 D : Value from dilution analysis
 D.O. : Diluted out

=====

Client : SES-TECH	Date Collected: 03/14/06
Project : CAMP PENDLETON, UST SITE 14137	Date Received: 03/15/06
Batch No. : 06C140	Date Extracted: 03/21/06 04:28
Lab ID: 0004-120	Date Analyzed: 03/21/06 04:28
Lab Sample ID: C140-03	Dilution Factor: 1
Lab File ID: RCC413	Matrix : WATER
Ext Btch ID: V067C27	% Moisture : NA
Calib. Ref.: RCC192	Instrument ID : T-067

=====

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	5	.2
1,1,2,2-TETRACHLOROETHANE	ND	1	.2
1,1,2-TRICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHENE	ND	5	.2
1,2-DICHLOROETHANE	ND	.5	.2
1,2-DICHLOROPROPANE	ND	5	.2
METHYL ETHYL KETONE	ND	50	.2
2-HEXANONE	ND	50	5
4-METHYL-2-PENTANONE (MIBK)	ND	50	5
ACETONE	ND	50	5
BENZENE	ND	.5	.2
BROMODICHLOROMETHANE	ND	5	.2
BROMOFORM	ND	5	.3
BROMOMETHANE	ND	5	.2
CARBON TETRACHLORIDE	ND	.5	.2
CHLOROBENZENE	ND	5	.2
CHLOROETHANE	ND	5	.2
CHLOROFORM	ND	5	.2
CHLOROMETHANE	ND	5	.2
CIS-1,2-DICHLOROETHENE	ND	5	.2
CIS-1,3-DICHLOROPROPENE	ND	.5	.2
DIBROMOCHLOROMETHANE	ND	5	.2
ETHYLBENZENE	ND	.5	.2
FLUORENE	ND	5	.2
HEXANE	ND	1	.2
METHYLENE CHLORIDE	ND	5	.5
STYRENE	ND	5	.2
TETRACHLOROETHYLENE	ND	5	.2
TOLUENE	ND	.5	.2
TRANS-1,2-DICHLOROETHENE	ND	5	.2
TRANS-1,3-DICHLOROPROPENE	ND	.5	.2
TRICHLOROETHENE	ND	5	.2
VINYL ACETATE	ND	50	.5
VINYL CHLORIDE	ND	.5	.2
TERT-BUTYL ALCOHOL	ND	20	5
DIISOPROPYL ETHER	ND	5	.2
ETHYL TERT-BUTYL ETHER	ND	5	.2
TERT-AMYL METHYL ETHER	ND	5	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	100	65-135
TOLUENE-D8	101	75-125
BROMOFLUOROBENZENE	108	75-125

R.L. : Reporting limit
 * : Out of QC
 E : Exceeded calibration range
 B : Found in associated method blank
 J : Value between R.L. and MDL
 D : Value from dilution analysis
 D.O. : Diluted out

=====

Client : SES-TECH	Date Collected: 03/14/06
Project : CAMP PENDLETON, UST SITE 14137	Date Received: 03/15/06
Batch No. : 06C140	Date Extracted: 03/21/06 05:04
Sample ID: 0004-121	Date Analyzed: 03/21/06 05:04
Lab Samp ID: C140-04	Dilution Factor: 1
Lab File ID: RCC414	Matrix : WATER
Ext Btch ID: V067C27	% Moisture : NA
Calib. Ref.: RCC192	Instrument ID : T-067

=====

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	5	.2
1,1,2,2-TETRACHLOROETHANE	ND	1	.2
1,1,2-TRICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHENE	ND	5	.2
1,2-DICHLOROETHANE	ND	.5	.2
1,2-DICHLOROPROPANE	ND	5	.2
METHYL ETHYL KETONE	ND	50	.2
2-HEXANONE	ND	50	5
4-METHYL-2-PENTANONE (MIBK)	ND	50	5
ACETONE	ND	50	5
BENZENE	ND	.5	.2
BROMODICHLOROMETHANE	ND	5	.2
BROMOFORM	ND	5	.3
BROMOMETHANE	ND	5	.2
CARBON TETRACHLORIDE	ND	.5	.2
CHLOROBENZENE	ND	5	.2
CHLOROETHANE	ND	5	.2
CHLOROFORM	ND	5	.2
CHLOROMETHANE	ND	5	.2
CIS-1,2-DICHLOROETHENE	ND	5	.2
CIS-1,3-DICHLOROPROPENE	ND	.5	.2
DIBROMOCHLOROMETHANE	ND	5	.2
ETHYLBENZENE	ND	.5	.2
XYLENES	ND	5	.2
MTBE	9.5	1	.2
METHYLENE CHLORIDE	ND	5	.5
STYRENE	ND	5	.2
TETRACHLOROETHYLENE	ND	5	.2
TOLUENE	ND	.5	.2
TRANS-1,2-DICHLOROETHENE	ND	5	.2
TRANS-1,3-DICHLOROPROPENE	ND	.5	.2
TRICHLOROETHENE	ND	5	.2
VINYL ACETATE	ND	50	.5
VINYL CHLORIDE	ND	.5	.2
TERT-BUTYL ALCOHOL	ND	20	5
DIISOPROPYL ETHER	ND	5	.2
ETHYL TERT-BUTYL ETHER	ND	5	.2
TERT-AMYL METHYL ETHER	ND	5	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	99	65-135
TOLUENE-D8	98	75-125
BROMOFLUOROBENZENE	99	75-125

R.L. : Reporting limit
 * : Out of QC
 E : Exceeded calibration range
 B : Found in associated method blank
 J : Value between R.L. and MDL
 D : Value from dilution analysis
 D.O. : Diluted out

Client : SES-TECH Date Collected: 03/14/06
Project : CAMP PENDLETON, UST SITE 14137 Date Received: 03/15/06
Batch No. : 06C140 Date Extracted: 03/21/06 05:39
Sample ID: 0004-122 Date Analyzed: 03/21/06 05:39
Lab File ID: RCC415 Dilution Factor: 1
Ext Btch ID: V067C27 Matrix : WATER
Calib. Ref.: RCC192 % Moisture : NA
Instrument ID : T-067

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	5	.2
1,1,2,2-TETRACHLOROETHANE	ND	1	.2
1,1,2-TRICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHENE	ND	5	.2
1,2-DICHLOROETHANE	ND	.5	.2
1,2-DICHLOROPROPANE	ND	5	.2
METHYL ETHYL KETONE	ND	50	.2
2-HEXANONE	ND	50	5
4-METHYL-2-PENTANONE (MIBK)	ND	50	5
ACETONE	ND	50	5
BENZENE	ND	.5	.2
BROMODICHLOROMETHANE	ND	5	.2
BROMOFORM	ND	5	.3
BROMOMETHANE	ND	5	.2
CARBON TETRACHLORIDE	ND	.5	.2
CHLOROBENZENE	ND	5	.2
CHLOROETHANE	ND	5	.2
CHLOROFORM	ND	5	.2
CHLOROMETHANE	ND	5	.2
CIS-1,2-DICHLOROETHENE	ND	5	.2
CIS-1,3-DICHLOROPROPENE	ND	.5	.2
DIBROMOCHLOROMETHANE	ND	5	.2
ETHYLBENZENE	ND	.5	.2
ETHYLENE	ND	5	.2
ETHYLENE CHLORIDE	ND	1	.2
STYRENE	ND	5	.2
TETRACHLOROETHYLENE	ND	5	.2
TOLUENE	ND	.5	.2
TRANS-1,2-DICHLOROETHENE	ND	5	.2
TRANS-1,3-DICHLOROPROPENE	ND	.5	.2
TRICHLOROETHENE	ND	5	.2
VINYL ACETATE	ND	50	.5
VINYL CHLORIDE	ND	.5	.2
TERT-BUTYL ALCOHOL	ND	20	5
DIISOPROPYL ETHER	ND	5	.2
ETHYL TERT-BUTYL ETHER	ND	5	.2
TERT-AMYL METHYL ETHER	ND	5	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	93	65-135
TOLUENE-D8	93	75-125
BROMOFLUOROBENZENE	98	75-125

R.L. : Reporting limit
* : Out of QC
E : Exceeded calibration range
B : Found in associated method blank
J : Value between R.L. and MDL
D : Value from dilution analysis
D.O. : Diluted out

=====
Client : SES-TECH Date Collected: 03/14/06
Project : CAMP PENDLETON, UST SITE 14137 Date Received: 03/15/06
Batch No. : 06C140 Date Extracted: 03/16/06 21:07
Sample ID: 0004-123 Date Analyzed: 03/16/06 21:07
Lab Samp ID: C140-06 Dilution Factor: 1
Lab File ID: RCC334 Matrix : WATER
Ext Btch ID: VO67C20 % Moisture : NA
Calib. Ref.: RCC192 Instrument ID : T-067
=====

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	5	.2
1,1,2,2-TETRACHLOROETHANE	ND	1	.2
1,1,2-TRICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHENE	ND	5	.2
1,2-DICHLOROETHANE	ND	.5	.2
1,2-DICHLOROPROPANE	ND	5	.2
METHYL ETHYL KETONE	ND	50	.2
2-HEXANONE	ND	50	5
4-METHYL-2-PENTANONE (MIBK)	ND	50	5
ACETONE	ND	50	5
BENZENE	ND	.5	.2
BROMODICHLOROMETHANE	ND	5	.2
BROMOFORM	ND	5	.3
BROMOMETHANE	ND	5	.2
CARBON TETRACHLORIDE	ND	.5	.2
CHLOROBENZENE	ND	5	.2
CHLOROETHANE	ND	5	.2
CHLOROFORM	ND	5	.2
CHLOROMETHANE	ND	5	.2
CIS-1,2-DICHLOROETHENE	ND	5	.2
CIS-1,3-DICHLOROPROPENE	ND	.5	.2
DIBROMOCHLOROMETHANE	ND	5	.2
ETHYLBENZENE	ND	.5	.2
XYLENES	ND	5	.2
MTBE	ND	1	.2
METHYLENE CHLORIDE	ND	5	.5
STYRENE	ND	5	.2
TETRACHLOROETHYLENE	ND	5	.2
TOLUENE	ND	.5	.2
TRANS-1,2-DICHLOROETHENE	ND	5	.2
TRANS-1,3-DICHLOROPROPENE	ND	.5	.2
TRICHLOROETHENE	ND	5	.2
VINYL ACETATE	ND	50	.5
VINYL CHLORIDE	ND	.5	.2
TERT-BUTYL ALCOHOL	ND	20	5
DIISOPROPYL ETHER	ND	5	.2
ETHYL TERT-BUTYL ETHER	ND	5	.2
TERT-AMYL METHYL ETHER	ND	5	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	100	65-135
TOLUENE-D8	104	75-125
BROMOFLUOROBENZENE	116	75-125

R.L. : Reporting limit
* : Out of QC
E : Exceeded calibration range
B : Found in associated method blank
J : Value between R.L. and MDL
D : Value from dilution analysis
D.O. : Diluted out

=====

Client : SES-TECH	Date Collected: 03/14/06
Project : CAMP PENDLETON, UST SITE 14137	Date Received: 03/15/06
No. : 06C140	Date Extracted: 03/21/06 06:15
Sample ID: 0004-124	Date Analyzed: 03/21/06 06:15
Lab Samp ID: C140-07	Dilution Factor: 1
Lab File ID: RCC416	Matrix : WATER
Ext Btch ID: V067C27	% Moisture : NA
Calib. Ref.: RCC192	Instrument ID : T-067

=====

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	5	.2
1,1,2,2-TETRACHLOROETHANE	ND	1	.2
1,1,2-TRICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHENE	ND	5	.2
1,2-DICHLOROETHANE	ND	.5	.2
1,2-DICHLOROPROPANE	ND	5	.2
METHYL ETHYL KETONE	ND	50	.2
2-HEXANONE	ND	50	5
4-METHYL-2-PENTANONE (MIBK)	ND	50	5
ACETONE	ND	50	5
BENZENE	ND	.5	.2
BROMODICHLOROMETHANE	.3J	5	.2
BROMOFORM	ND	5	.3
BROMOMETHANE	ND	5	.2
CARBON TETRACHLORIDE	ND	.5	.2
CHLOROBENZENE	ND	5	.2
CHLOROETHANE	ND	5	.2
CHLOROFORM	ND	5	.2
CHLOROMETHANE	ND	5	.2
CIS-1,2-DICHLOROETHENE	ND	5	.2
CIS-1,3-DICHLOROPROPENE	ND	.5	.2
DIBROMOCHLOROMETHANE	.32J	5	.2
1,2-DIBROMOETHANE	ND	.5	.2
1,1,2,2-TETRABROMOETHANE	ND	5	.2
1,1,1,2-TETRABROMOETHANE	.41J	1	.2
METHYLENE CHLORIDE	ND	5	.5
STYRENE	ND	5	.2
TETRACHLOROETHYLENE	ND	5	.2
TOLUENE	ND	.5	.2
TRANS-1,2-DICHLOROETHENE	ND	5	.2
TRANS-1,3-DICHLOROPROPENE	ND	.5	.2
TRICHLOROETHENE	ND	5	.2
VINYL ACETATE	ND	50	.5
VINYL CHLORIDE	ND	.5	.2
TERT-BUTYL ALCOHOL	ND	20	5
DIISOPROPYL ETHER	ND	5	.2
ETHYL TERT-BUTYL ETHER	ND	5	.2
TERT-AMYL METHYL ETHER	ND	5	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	97	65-135
TOLUENE-D8	98	75-125
BROMOFLUOROBENZENE	106	75-125

R.L. : Reporting limit
 * : Out of QC
 E : Exceeded calibration range
 B : Found in associated method blank
 J : Value between R.L. and MDL
 D : Value from dilution analysis
 D.O. : Diluted out

```

=====
Client      : SES-TECH                      Date Collected: 03/14/06
Project     : CAMP PENDLETON, UST SITE 14137 Date Received: 03/15/06
Batch No.   : 06C140                      Date Extracted: 03/21/06 06:50
Sample ID   : 0004-125                    Date Analyzed: 03/21/06 06:50
Lab Samp ID : C140-08                     Dilution Factor: 1
Lab File ID : RCC417                     Matrix       : WATER
Ext Btch ID : V067C27                    % Moisture    : NA
Calib. Ref. : RCC192                     Instrument ID : T-067
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	5	.2
1,1,2,2-TETRACHLOROETHANE	ND	1	.2
1,1,2-TRICHLOROPROPANE	ND	5	.2
1,1-DICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHENE	ND	5	.2
1,2-DICHLOROETHANE	ND	.5	.2
1,2-DICHLOROPROPANE	ND	5	.2
METHYL ETHYL KETONE	ND	50	.2
2-HEXANONE	ND	50	5
4-METHYL-2-PENTANONE (MIBK)	ND	50	5
ACETONE	ND	50	5
BENZENE	ND	.5	.2
BROMODICHLOROMETHANE	.31J	5	.2
BROMOFORM	ND	5	.3
BROMOMETHANE	ND	5	.2
CARBON TETRACHLORIDE	ND	.5	.2
CHLOROBENZENE	ND	5	.2
CHLOROETHANE	ND	5	.2
CHLOROFORM	ND	5	.2
CHLOROMETHANE	ND	5	.2
CIS-1,2-DICHLOROETHENE	ND	5	.2
CIS-1,3-DICHLOROPROPENE	ND	.5	.2
DIBROMOCHLOROMETHANE	.33J	5	.2
ETHYLBENZENE	ND	.5	.2
XYLENES	ND	5	.2
MTBE	.44J	1	.2
METHYLENE CHLORIDE	ND	5	.5
STYRENE	ND	5	.2
TETRACHLOROETHYLENE	ND	5	.2
TOLUENE	ND	.5	.2
TRANS-1,2-DICHLOROETHENE	ND	5	.2
TRANS-1,3-DICHLOROPROPENE	ND	.5	.2
TRICHLOROETHENE	ND	5	.2
VINYL ACETATE	ND	50	.5
VINYL CHLORIDE	ND	.5	.2
TERT-BUTYL ALCOHOL	ND	20	5
DIISOPROPYL ETHER	ND	5	.2
ETHYL TERT-BUTYL ETHER	ND	5	.2
TERT-AMYL METHYL ETHER	ND	5	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	103	65-135
TOLUENE-D8	103	75-125
BROMOFLUOROBENZENE	110	75-125

R.L. : Reporting limit
 * : Out of QC
 E : Exceeded calibration range
 B : Found in associated method blank
 J : Value between R.L. and MDL
 D : Value from dilution analysis
 D.O. : Diluted out

```

=====
Client   : SES-TECH                      Date Collected: 03/14/06
Project  : CAMP PENDLETON, UST SITE 14137 Date Received: 03/15/06
No.      : 06C140                        Date Extracted: 03/21/06 07:25
e ID:    0004-126                        Date Analyzed: 03/21/06 07:25
Lab Samp ID: C140-09                     Dilution Factor: 1
Lab File ID: RCC418                       Matrix       : WATER
Ext Btch ID: V067C27                     % Moisture   : NA
Calib. Ref.: RCC192                       Instrument ID : T-067
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	5	.2
1,1,2,2-TETRACHLOROETHANE	ND	1	.2
1,1,2-TRICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHENE	ND	5	.2
1,2-DICHLOROETHANE	ND	.5	.2
1,2-DICHLOROPROPANE	ND	5	.2
METHYL ETHYL KETONE	ND	50	.2
2-HEXANONE	ND	50	5
4-METHYL-2-PENTANONE (MIBK)	ND	50	5
ACETONE	5.1J	50	5
BENZENE	ND	.5	.2
BROMODICHLOROMETHANE	.22J	5	.2
BROMOFORM	ND	5	.3
BROMOMETHANE	ND	5	.2
CARBON TETRACHLORIDE	ND	.5	.2
CHLOROBENZENE	ND	5	.2
CHLOROETHANE	ND	5	.2
CHLOROFORM	.31J	5	.2
CHLOROMETHANE	ND	5	.2
CIS-1,2-DICHLOROETHENE	ND	5	.2
CIS-1,3-DICHLOROPROPENE	ND	.5	.2
DIBROMOCHLOROMETHANE	ND	5	.2
FLUOROBENZENE	ND	.5	.2
HEXANE	ND	5	.2
MIBK	ND	1	.2
METHYLENE CHLORIDE	ND	5	.5
STYRENE	ND	5	.2
TETRACHLOROETHYLENE	ND	5	.2
TOLUENE	ND	.5	.2
TRANS-1,2-DICHLOROETHENE	ND	5	.2
TRANS-1,3-DICHLOROPROPENE	ND	.5	.2
TRICHLOROETHENE	ND	5	.2
VINYL ACETATE	ND	50	.5
VINYL CHLORIDE	ND	.5	.2
TERT-BUTYL ALCOHOL	ND	20	5
DIISOPROPYL ETHER	ND	5	.2
ETHYL TERT-BUTYL ETHER	ND	5	.2
TERT-AMYL METHYL ETHER	ND	5	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	97	65-135
TOLUENE-D8	100	75-125
BROMOFLUOROBENZENE	107	75-125

R.L. : Reporting limit
 * : Out of QC
 E : Exceeded calibration range
 B : Found in associated method blank
 J : Value between R.L. and MDL
 D : Value from dilution analysis
 D.O. : Diluted out

QC SUMMARIES

=====
Client : SES-TECH Date Collected: NA
Project : CAMP PENDLETON, UST SITE 14137 Date Received: 03/16/06
Batch No. : 06C140 Date Extracted: 03/16/06 15:48
Le ID: MBLK1W Date Analyzed: 03/16/06 15:48
Samp ID: VO67C200 Dilution Factor: 1
Lab File ID: RCC325 Matrix : WATER
Ext Btch ID: VO67C20 % Moisture : NA
Calib. Ref.: RCC192 Instrument ID : T-067
=====

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	5	.2
1,1,2,2-TETRACHLOROETHANE	ND	1	.2
1,1,2-TRICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHENE	ND	5	.2
1,2-DICHLOROETHANE	ND	.5	.2
1,2-DICHLOROPROPANE	ND	5	.2
METHYL ETHYL KETONE	ND	50	.2
2-HEXANONE	ND	50	5
4-METHYL-2-PENTANONE (MIBK)	ND	50	5
ACETONE	ND	50	5
BENZENE	ND	.5	.2
BROMODICHLOROMETHANE	ND	5	.2
BROMOFORM	ND	5	.3
BROMOMETHANE	ND	5	.2
CARBON TETRACHLORIDE	ND	.5	.2
CHLOROBENZENE	ND	5	.2
CHLOROETHANE	ND	5	.2
CHLOROFORM	ND	5	.2
CHLOROMETHANE	ND	5	.2
CIS-1,2-DICHLOROETHENE	ND	5	.2
CIS-1,3-DICHLOROPROPENE	ND	.5	.2
DIBROMOCHLOROMETHANE	ND	5	.2
ETHYLBENZENE	ND	.5	.2
ETHANES	ND	5	.2
ETHYLENE CHLORIDE	ND	5	.5
STYRENE	ND	5	.2
TETRACHLOROETHYLENE	ND	5	.2
TOLUENE	ND	.5	.2
TRANS-1,2-DICHLOROETHENE	ND	5	.2
TRANS-1,3-DICHLOROPROPENE	ND	.5	.2
TRICHLOROETHENE	ND	5	.2
VINYL ACETATE	ND	50	.5
VINYL CHLORIDE	ND	.5	.2
TERT-BUTYL ALCOHOL	ND	20	5
DIISOPROPYL ETHER	ND	5	.2
ETHYL TERT-BUTYL ETHER	ND	5	.2
TERT-AMYL METHYL ETHER	ND	5	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	96	65-135
TOLUENE-D8	101	75-125
BROMOFLUOROBENZENE	114	75-125

R.L. : Reporting limit
* : Out of QC
E : Exceeded calibration range
B : Found in associated method blank
J : Value between R.L. and MDL
D : Value from dilution analysis
D.O. : Diluted out

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

LABORATORY, INC.

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14137
BATCH NO.: 06C140
METHOD: SW 5030B/8260B

MATRIX: WATER % MOISTURE: NA
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK1W
LAB SAMP ID: VO67C20Q VO67C20L VO67C20C
LAB FILE ID: RCC325 RCC321 RCC323
DATE EXTRACTED: 03/16/0615:48 03/16/0612:51 03/16/0614:02 DATE COLLECTED: NA
DATE ANALYZED: 03/16/0615:48 03/16/0612:51 03/16/0614:02 DATE RECEIVED: 03/16/06
PREP. BATCH: VO67C20 VO67C20 VO67C20
CALIB. REF: RCC192 RCC192 RCC192

ACCESSION:

PARAMETER	BLNK RSLT (ug/L)	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
1,1-Dichloroethene	ND	10	10.8	108	10	9.21	92	16	75-125	20
Benzene	ND	10	10.3	103	10	9.91	99	4	75-125	20
Chlorobenzene	ND	10	10.8	108	10	10.1	101	7	75-125	20
Toluene	ND	10	10.7	107	10	10.2	102	4	75-125	20
Trichloroethene	ND	10	10.5	105	10	9.88	99	6	75-125	20

SURROGATE PARAMETER	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	QC LIMIT (%)
1,2-Dichloroethane-d4	10	10.4	104	10	9.14	91	65-135
Toluene-d8	10	9.65	96	10	9.03	90	75-125
Bromofluorobenzene	10	9.04	90	10	8.95	89	75-125

Client : SES-TECH Date Collected: NA
Project : CAMP PENDLETON, UST SITE 14137 Date Received: 03/21/06
No. : 06C140 Date Extracted: 03/21/06 02:06
e ID: MBLK2W Date Analyzed: 03/21/06 02:06
Lab Samp ID: V067C27Q Dilution Factor: 1
Lab File ID: RCC409 Matrix : WATER
Ext Btch ID: V067C27 % Moisture : NA
Calib. Ref.: RCC192 Instrument ID : T-067

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
1,1,1-TRICHLOROETHANE	ND	5	.2
1,1,2,2-TETRACHLOROETHANE	ND	1	.2
1,1,2-TRICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHANE	ND	5	.2
1,1-DICHLOROETHENE	ND	5	.2
1,2-DICHLOROETHANE	ND	.5	.2
1,2-DICHLOROPROPANE	ND	5	.2
METHYL ETHYL KETONE	ND	50	.2
2-HEXANONE	ND	50	5
4-METHYL-2-PENTANONE (MIBK)	ND	50	5
ACETONE	ND	50	5
BENZENE	ND	.5	.2
BROMODICHLOROMETHANE	ND	5	.2
BROMOFORM	ND	5	.3
BROMOMETHANE	ND	5	.2
CARBON TETRACHLORIDE	ND	.5	.2
CHLOROBENZENE	ND	5	.2
CHLOROETHANE	ND	5	.2
CHLOROFORM	ND	5	.2
CHLOROMETHANE	ND	5	.2
CIS-1,2-DICHLOROETHENE	ND	5	.2
CIS-1,3-DICHLOROPROPENE	ND	.5	.2
DIBROMOCHLOROMETHANE	ND	5	.2
BENZENE	ND	.5	.2
IES	ND	5	.2
MIBK	ND	1	.2
METHYLENE CHLORIDE	ND	5	.5
STYRENE	ND	5	.2
TETRACHLOROETHYLENE	ND	5	.2
TOLUENE	ND	.5	.2
TRANS-1,2-DICHLOROETHENE	ND	5	.2
TRANS-1,3-DICHLOROPROPENE	ND	.5	.2
TRICHLOROETHENE	ND	5	.2
VINYL ACETATE	ND	50	.5
VINYL CHLORIDE	ND	.5	.2
TERT-BUTYL ALCOHOL	ND	20	5
DIISOPROPYL ETHER	ND	5	.2
ETHYL TERT-BUTYL ETHER	ND	5	.2
TERT-AMYL METHYL ETHER	ND	5	.2

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
1,2-DICHLOROETHANE-D4	106	65-135
TOLUENE-D8	100	75-125
BROMOFLUOROBENZENE	108	75-125

R.L. : Reporting limit
* : Out of QC
E : Exceeded calibration range
B : Found in associated method blank
J : Value between R.L. and MDL
D : Value from dilution analysis
D.O. : Diluted out

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

SVS
LABORATORY, INC.

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14137
BATCH NO.: 06C140
METHOD: SW 5030B/8260B

MATRIX: WATER
DILUTION FACTOR: 1 1 1
SAMPLE ID: MBLK2W
LAB SAMP ID: V067C27Q V067C27L V067C27C
LAB FILE ID: RCC409 RCC406 RCC407
DATE EXTRACTED: 03/21/0602:06 03/21/0600:20 03/21/0600:56 DATE COLLECTED: NA
DATE ANALYZED: 03/21/0602:06 03/21/0600:20 03/21/0600:56 DATE RECEIVED: 03/21/06
PREP. BATCH: V067C27 V067C27 V067C27
CALIB. REF: RCC192 RCC192 RCC192

ACCESSION:

PARAMETER	BLNK RSLT (ug/L)	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
1,1-Dichloroethene	ND	10	9.56	96	10	9.09	91	5	75-125	20
Benzene	ND	10	10	100	10	9.58	96	4	75-125	20
Chlorobenzene	ND	10	10.1	101	10	9.63	96	4	75-125	20
Toluene	ND	10	9.96	100	10	9.65	97	3	75-125	20
Trichloroethene	ND	10	9.58	96	10	9.2	92	4	75-125	20

SURROGATE PARAMETER	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	QC LIMIT (%)
1,2-Dichloroethane-d4	10	9.59	96	10	9.63	96	65-135
Toluene-d8	10	9.45	95	10	9.12	91	75-125
Bromofluorobenzene	10	9.58	96	10	8.94	89	75-125

EMAX QUALITY CONTROL DATA
MS/MSD ANALYSIS

5070777
LABORATORY, INC.

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14137
BATCH NO.: 06C140
METHOD: SW 5030B/8260B

MATRIX: WATER % MOISTURE: NA
DILUTION FACTOR: 1 1
SAMPLE ID: 0004-123
LAB SAMP ID: C140-06 C140-06M C140-06S
LAB FILE ID: RCC334 RCC337 RCC338
DATE EXTRACTED: 03/16/0621:07 03/16/0622:54 03/16/0623:30 DATE COLLECTED: 03/14/06
DATE ANALYZED: 03/16/0621:07 03/16/0622:54 03/16/0623:30 DATE RECEIVED: 03/15/06
PREP. BATCH: V067C20 V067C20 V067C20
CALIB. REF: RCC192 RCC192 RCC192

ACCESSION:

PARAMETER	SMPL RSLT (ug/L)	SPIKE AMT (ug/L)	MS RSLT (ug/L)	MS % REC	SPIKE AMT (ug/L)	MSD RSLT (ug/L)	MSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
1,1-Dichloroethene	ND	10	9.83	98	10	9.14	91	7	75-125	20
Benzene	ND	10	10.6	106	10	9.8	98	8	75-125	20
Chlorobenzene	ND	10	10.9	109	10	9.96	100	9	75-125	20
Toluene	ND	10	10.8	108	10	10	100	8	75-125	20
Trichloroethene	ND	10	10.3	103	10	9.67	97	6	75-125	20

SURROGATE PARAMETER	SPIKE AMT (ug/L)	MS RSLT (ug/L)	MS % REC	SPIKE AMT (ug/L)	MSD RSLT (ug/L)	MSD % REC	QC LIMIT (%)
1,2-Dichloroethane-d4	10	10.9	109	10	9.24	92	65-135
Toluene-d8	10	10.1	101	10	9.58	96	75-125
Bromofluorobenzene	10	9.62	96	10	9.17	92	75-125

LABORATORY REPORT FOR

SES-TECH

CAMP PENDLETON, UST SITE 14137

METHOD 3520C/8270C SIM
SEMI VOLATILE ORGANICS BY GC/MS

SDG#: 06C140

CASE NARRATIVE

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14137
SDG: 06C140

METHOD 3520C/8270C SIM SEMI VOLATILE ORGANICS BY GC/MS

Eight (8) water samples were received on 03/15/06 for Semi Volatile Organic analysis by Method 3520C/8270C SIM in accordance with USEPA SW846, 3rd ed.

1. Holding Time

Analytical holding time was met.

2. Tuning and Calibration

Tuning and calibration were carried out at 12-hour interval. All QC requirements were met.

3. Method Blank

Method blank was free of contamination at half of the reporting limit.

4. Surrogate Recovery

Recoveries were within QC limit.

5. Lab Control Sample/Lab Control Sample Duplicate

Recoveries were within QC limit.

6. Matrix Spike/Matrix Spike Duplicate

Sample C140-06 was spiked. All recoveries were within QC limit.

7. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met.

LAB CHRONICLE
SEMI VOLATILE ORGANICS BY GC/MS

Client : SES-TECH
Project : CAMP PENDLETON, UST SITE 14137

SDG NO. : 06C140
Instrument ID : T-048

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	WATER		Extraction Date/Time	Sample Data FN	Calibration Prep. Data FN	Batch	Notes
				Analysis Date/Time						
0004-119	SVC018WB	1	NA	03/20/0611:37		03/17/0617:00	RCZ256	RCZ053	SVC018W	Method Blank
0004-120	SVC018WL	1	NA	03/20/0611:56		03/17/0617:00	RCZ257	RCZ053	SVC018W	Lab Control Sample (LCS)
0004-121	SVC018WC	1	NA	03/20/0612:15		03/17/0617:00	RCZ258	RCZ053	SVC018W	LCS Duplicate
0004-122	C140-02	.95	NA	03/20/0615:37		03/17/0617:00	RCZ265	RCZ053	SVC018W	Field Sample
0004-123	C140-03	.94	NA	03/20/0615:56		03/17/0617:00	RCZ266	RCZ053	SVC018W	Field Sample
0004-124	C140-04	.97	NA	03/20/0616:15		03/17/0617:00	RCZ267	RCZ053	SVC018W	Field Sample
0004-125	C140-05	.94	NA	03/20/0616:35		03/17/0617:00	RCZ268	RCZ053	SVC018W	Field Sample
0004-126	C140-06	.94	NA	03/20/0616:54		03/17/0617:00	RCZ269	RCZ053	SVC018W	Field Sample
0004-127	C140-06M	.94	NA	03/20/0617:13		03/17/0617:00	RCZ270	RCZ053	SVC018W	Matrix Spike Sample (MS)
0004-128	C140-06S	.94	NA	03/20/0617:32		03/17/0617:00	RCZ271	RCZ053	SVC018W	MS Duplicate (MSD)
0004-129	C140-07	.97	NA	03/20/0617:51		03/17/0617:00	RCZ272	RCZ053	SVC018W	Field Sample
0004-130	C140-08	.96	NA	03/20/0618:10		03/17/0617:00	RCZ273	RCZ053	SVC018W	Field Sample
0004-131	C140-09	.94	NA	03/20/0618:29		03/17/0617:00	RCZ274	RCZ053	SVC018W	Field Sample

FN - Filename
% Moist - Percent Moisture

0002

LABORATORY, INC.

SAMPLE RESULTS

SW 3520C/8270C SIM
SEMI VOLATILE ORGANICS BY GC/MS

```

=====
Client      : SES-TECH                      Date Collected: 03/14/06
Project     : CAMP PENDLETON, UST SITE 14137 Date Received: 03/15/06
Batch No.   : 06C140                       Date Extracted: 03/17/06 17:00
Sample ID: 0004-119                         Date Analyzed: 03/20/06 15:37
Samp ID: C140-02                           Dilution Factor: .95
File ID: RCZ265                             Matrix : WATER
Batch ID: SVC018W                           % Moisture : NA
Calib. Ref.: RC2053                         Instrument ID : T-048
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
ACENAPHTHENE	ND	.95	.19
ACENAPHTHYLENE	ND	.95	.19
ANTHRACENE	ND	1.9	.19
BENZO(A)ANTHRACENE	ND	1.9	.19
BENZO(A)PYRENE	ND	.95	.19
BENZO(B)FLUORANTHENE	ND	.95	.19
BENZO(K)FLUORANTHENE	ND	1.9	.19
BENZO(G,H,I)PERYLENE	ND	.95	.19
CHRYSENE	ND	1.9	.19
DIBENZO(A,H)ANTHRACENE	ND	.95	.19
FLUORANTHENE	ND	1.9	.19
FLUORENE	ND	1.9	.19
INDENO(1,2,3-CD)PYRENE	ND	.95	.19
NAPHTHALENE	ND	.95	.19
PHENANTHRENE	ND	.95	.19
PYRENE	ND	1.9	.19
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT	
TERPHENYL-D14	71	50-130	

RL: Reporting Limit

SW 3520C/8270C SIM
SEMI VOLATILE ORGANICS BY GC/MS

507780-8A
LABORATORY, INC.

```

=====
Client       : SES-TECH                      Date Collected: 03/14/06
Project      : CAMP PENDLETON, UST SITE 14137 Date Received: 03/15/06
Batch No.    : 06C140                       Date Extracted: 03/17/06 17:00
Sample ID    : 0004-120                     Date Analyzed: 03/20/06 15:56
Lab Samp ID  : C140-03                      Dilution Factor: .94
Lab File ID  : RCZ266                       Matrix: WATER
Ext Btch ID  : SVC018W                      % Moisture: NA
Calib. Ref.: RCZ053                        Instrument ID: T-048
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
ACENAPHTHENE	ND	.94	.19
ACENAPHTHYLENE	ND	.94	.19
ANTHRACENE	ND	1.9	.19
BENZO(A)ANTHRACENE	ND	1.9	.19
BENZO(A)PYRENE	ND	.94	.19
BENZO(B)FLUORANTHENE	ND	.94	.19
BENZO(K)FLUORANTHENE	ND	1.9	.19
BENZO(G,H,I)PERYLENE	ND	.94	.19
CHRYSENE	ND	1.9	.19
DIBENZO(A,H)ANTHRACENE	ND	.94	.19
FLUORANTHENE	ND	1.9	.19
FLUORENE	ND	1.9	.19
INDENO(1,2,3-CD)PYRENE	ND	.94	.19
NAPHTHALENE	ND	.94	.19
PHENANTHRENE	ND	.94	.19
PYRENE	ND	1.9	.19

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
TERPHENYL-D14	68	50-130

RL: Reporting Limit

SW 3520C/8270C SIM
SEMI VOLATILE ORGANICS BY GC/MS

SWA
LABORATORIES, INC.

```

=====
Client      : SES-TECH                      Date Collected: 03/14/06
Project     : CAMP PENDLETON, UST SITE 14137 Date Received: 03/15/06
Batch No.   : 06C140                       Date Extracted: 03/17/06 17:00
Sample ID   : 0004-121                     Date Analyzed: 03/20/06 16:15
Samp ID     : C140-04                      Dilution Factor: .97
File ID     : RCZ267                       Matrix: WATER
Btch ID     : SVC018W                      % Moisture: NA
Calib. Ref. : RCZ053                       Instrument ID: T-048
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
ACENAPHTHENE	ND	.97	.19
ACENAPHTHYLENE	ND	.97	.19
ANTHRACENE	ND	1.9	.19
BENZO(A)ANTHRACENE	ND	1.9	.19
BENZO(A)PYRENE	ND	.97	.19
BENZO(B)FLUORANTHENE	ND	.97	.19
BENZO(K)FLUORANTHENE	ND	1.9	.19
BENZO(G,H,I)PERYLENE	ND	.97	.19
CHRYSENE	ND	1.9	.19
DIBENZO(A,H)ANTHRACENE	ND	.97	.19
FLUORANTHENE	ND	1.9	.19
FLUORENE	ND	1.9	.19
INDENO(1,2,3-CD)PYRENE	ND	.97	.19
NAPHTHALENE	ND	.97	.19
PHENANTHRENE	ND	.97	.19
PYRENE	ND	1.9	.19

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
TERPHENYL-D14	67	50-130

RL: Reporting Limit

SW 3520C/8270C SIM
SEMI VOLATILE ORGANICS BY GC/MS

ENVIRON
LABORATORIES, INC.

```

=====
Client       : SES-TECH                      Date Collected: 03/14/06
Project      : CAMP PENDLETON, UST SITE 14137 Date Received: 03/15/06
Batch No.    : 06C140                       Date Extracted: 03/17/06 17:00
Sample ID    : 0004-122                     Date Analyzed: 03/20/06 16:35
Lab Samp ID  : C140-05                      Dilution Factor: .94
Lab File ID  : RCZ268                       Matrix          : WATER
Ext Btch ID  : SVC018W                      % Moisture      : NA
Calib. Ref.  : RCZ053                       Instrument ID   : T-048
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
ACENAPHTHENE	ND	.94	.19
ACENAPHTHYLENE	ND	.94	.19
ANTHRACENE	ND	1.9	.19
BENZO(A)ANTHRACENE	ND	1.9	.19
BENZO(A)PYRENE	ND	.94	.19
BENZO(B)FLUORANTHENE	ND	.94	.19
BENZO(K)FLUORANTHENE	ND	1.9	.19
BENZO(G,H,I)PERYLENE	ND	.94	.19
CHRYSENE	ND	1.9	.19
DIBENZO(A,H)ANTHRACENE	ND	.94	.19
FLUORANTHENE	ND	1.9	.19
FLUORENE	ND	1.9	.19
INDENO(1,2,3-CD)PYRENE	ND	.94	.19
NAPHTHALENE	ND	.94	.19
PHENANTHRENE	ND	.94	.19
PYRENE	ND	1.9	.19

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
TERPHENYL-D14	68	50-130

RL: Reporting Limit

Client : SES-TECH Date Collected: 03/14/06
Project : CAMP PENDLETON, UST SITE 14137 Date Received: 03/15/06
Batch No. : 06C140 Date Extracted: 03/17/06 17:00
Sample ID: 0004-123 Date Analyzed: 03/20/06 16:54
Samp ID: C140-06 Dilution Factor: .94
File ID: RCZ269 Matrix : WATER
Batch ID: SVC018W % Moisture : NA
Lab. Ref.: RCZ053 Instrument ID : T-048

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
ACENAPHTHENE	ND	.94	.19
ACENAPHTHYLENE	ND	.94	.19
ANTHRACENE	ND	1.9	.19
BENZO(A)ANTHRACENE	ND	1.9	.19
BENZO(A)PYRENE	ND	.94	.19
BENZO(B)FLUORANTHENE	ND	.94	.19
BENZO(K)FLUORANTHENE	ND	1.9	.19
BENZO(G,H,I)PERYLENE	ND	.94	.19
CHRYSENE	ND	1.9	.19
DIBENZO(A,H)ANTHRACENE	ND	.94	.19
FLUORANTHENE	ND	1.9	.19
FLUORENE	ND	1.9	.19
INDENO(1,2,3-CD)PYRENE	ND	.94	.19
NAPHTHALENE	ND	.94	.19
PHENANTHRENE	ND	.94	.19
PYRENE	ND	1.9	.19

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
TERPHENYL-D14	70	50-130

RL: Reporting Limit

```

=====
Client      : SES-TECH                      Date Collected: 03/14/06
Project     : CAMP PENDLETON, UST SITE 14137 Date Received: 03/15/06
Batch No.   : 06C140                      Date Extracted: 03/17/06 17:00
Sample ID   : 0004-124                    Date Analyzed: 03/20/06 17:51
Lab Samp ID : C140-07                     Dilution Factor: .97
Lab File ID : RC2272                      Matrix          : WATER
Ext Btch ID : SVC018W                     % Moisture      : NA
Calib. Ref. : RC2053                     Instrument ID   : T-048
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
ACENAPHTHENE	ND	.97	.19
ACENAPHTHYLENE	ND	.97	.19
ANTHRACENE	ND	1.9	.19
BENZO(A)ANTHRACENE	ND	1.9	.19
BENZO(A)PYRENE	ND	.97	.19
BENZO(B)FLUORANTHENE	ND	.97	.19
BENZO(K)FLUORANTHENE	ND	1.9	.19
BENZO(G,H,I)PERYLENE	ND	.97	.19
CHRYSENE	ND	1.9	.19
DIBENZO(A,H)ANTHRACENE	ND	.97	.19
FLUORANTHENE	ND	1.9	.19
FLUORENE	ND	1.9	.19
INDENO(1,2,3-CD)PYRENE	ND	.97	.19
NAPHTHALENE	ND	.97	.19
PHENANTHRENE	ND	.97	.19
PYRENE	ND	1.9	.19

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
TERPHENYL-D14	74	50-130

RL: Reporting Limit

```

=====
Client      : SES-TECH                      Date Collected: 03/14/06
Project     : CAMP PENDLETON, UST SITE 14137 Date Received: 03/15/06
Batch No.   : 06C140                      Date Extracted: 03/17/06 17:00
Sample ID: 0004-125                      Date Analyzed: 03/20/06 18:10
Sample ID: C140-08                      Dilution Factor: .96
File ID: RC2273                          Matrix : WATER
Batch ID: SVC018W                        % Moisture : NA
Lab. Ref.: RC2053                        Instrument ID : T-048
=====

```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
ACENAPHTHENE	ND	.96	.19
ACENAPHTHYLENE	ND	.96	.19
ANTHRACENE	ND	1.9	.19
BENZO(A)ANTHRACENE	ND	1.9	.19
BENZO(A)PYRENE	ND	.96	.19
BENZO(B)FLUORANTHENE	ND	.96	.19
BENZO(K)FLUORANTHENE	ND	1.9	.19
BENZO(G,H,I)PERYLENE	ND	.96	.19
CHRYSENE	ND	1.9	.19
DIBENZO(A,H)ANTHRACENE	ND	.96	.19
FLUORANTHENE	ND	1.9	.19
FLUORENE	ND	1.9	.19
INDENO(1,2,3-CD)PYRENE	ND	.96	.19
NAPHTHALENE	ND	.96	.19
PHENANTHRENE	ND	.96	.19
PYRENE	ND	1.9	.19

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
TERPHENYL-D14	74	50-130

RL: Reporting Limit

SW 3520C/8270C SIM
SEMI VOLATILE ORGANICS BY GC/MS

MAX
LABORATORY, INC.

```

=====
Client       : SES-TECH                      Date Collected: 03/14/06
Project      : CAMP PENDLETON, UST SITE 14137 Date Received: 03/15/06
Batch No.    : 06C140                       Date Extracted: 03/17/06 17:00
Sample ID    : 0004-126                     Date Analyzed: 03/20/06 18:29
Lab Samp ID  : C140-09                      Dilution Factor: .94
Lab File ID  : RC2274                       Matrix: WATER
Ext Btch ID  : SVC018W                     % Moisture: NA
Calib. Ref.: RC2053                        Instrument ID: T-048
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
ACENAPHTHENE	ND	.94	.19
ACENAPHTHYLENE	ND	.94	.19
ANTHRACENE	ND	1.9	.19
BENZO(A)ANTHRACENE	ND	1.9	.19
BENZO(A)PYRENE	ND	.94	.19
BENZO(B)FLUORANTHENE	ND	.94	.19
BENZO(K)FLUORANTHENE	ND	1.9	.19
BENZO(G,H,I)PERYLENE	ND	.94	.19
CHRYSENE	ND	1.9	.19
DIBENZO(A,H)ANTHRACENE	ND	.94	.19
FLUORANTHENE	ND	1.9	.19
FLUORENE	ND	1.9	.19
INDENO(1,2,3-CD)PYRENE	ND	.94	.19
NAPHTHALENE	ND	.94	.19
PHENANTHRENE	ND	.94	.19
PYRENE	ND	1.9	.19

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
TERPHENYL-D14	81	50-130

RL: Reporting Limit

QC SUMMARY

SW 3520C/8270C SIM
SEMI VOLATILE ORGANICS BY GC/MS

EMMA
LABORATORY, INC.

```

=====
Client   : SES-TECH                      Date Collected: NA
Project  : CAMP PENDLETON, UST SITE 14137 Date Received: 03/17/06
Batch No.: 06C140                       Date Extracted: 03/17/06 17:00
Sample ID: MBLK1W                        Date Analyzed: 03/20/06 11:37
Samp ID: SVC018WB                       Dilution Factor: 1
File ID: RCZ256                         Matrix: WATER
Btch ID: SVC018W                        % Moisture: NA
Calib. Ref.: RCZ053                     Instrument ID: T-048
=====
  
```

PARAMETERS	RESULTS (ug/L)	RL (ug/L)	MDL (ug/L)
ACENAPHTHENE	ND	1	.2
ACENAPHTHYLENE	ND	1	.NN
ANTHRACENE	ND	2	.NN
BENZO(A)ANTHRACENE	ND	2	.NN
BENZO(A)PYRENE	ND	1	.2
BENZO(B)FLUORANTHENE	ND	1	.2
BENZO(K)FLUORANTHENE	ND	2	.2
BENZO(G,H,I)PERYLENE	ND	1	.2
CHRYSENE	ND	2	.2
DIBENZO(A,H)ANTHRACENE	ND	1	.2
FLUORANTHENE	ND	2	.2
FLUORENE	ND	2	.2
INDENO(1,2,3-CD)PYRENE	ND	1	.2
NAPHTHALENE	ND	1	.2
PHENANTHRENE	ND	1	.2
PYRENE	ND	2	.2
SURROGATE PARAMETERS	% RECOVERY	QC LIMIT	
TERPHENYL-D14	77	50-130	

RL: Reporting Limit

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

EMAX
LABORATORIES, INC.

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14137
BATCH NO.: 06C140
METHOD: SW 3520C/8270C SIM

MATRIX: WATER
DILUTION FACTOR: 1 1 % MOISTURE: NA
SAMPLE ID: MBLK1W
LAB SAMP ID: SVC018WB SVC018WL SVC018WC
LAB FILE ID: RCZ256 RCZ257 RCZ258
DATE EXTRACTED: 03/17/06 17:00 03/17/06 17:00 03/17/06 17:00 DATE COLLECTED: NA
DATE ANALYZED: 03/20/06 11:37 03/20/06 11:56 03/20/06 12:15 DATE RECEIVED: 03/17/06
PREP. BATCH: SVC018W
CALIB. REF: RCZ053 RCZ053 RCZ053

PARAMETER	BLNK RSLT (ug/L)	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Acenaphthene	ND	10	5.74	57	10	5.05	51	13	40-130	30
Acenaphthylene	ND	10	6.19	62	10	5.43	54	13	40-130	30
Anthracene	ND	10	6.51	65	10	6.07	61	7	50-130	30
Benzo(a)anthracene	ND	10	7.71	77	10	7.6	76	2	50-130	30
Benzo(a)pyrene	ND	10	7.68	77	10	7.44	74	2	50-130	30
Benzo(b)fluoranthene	ND	10	8.81	88	10	8.63	86	2	50-130	30
Benzo(k)fluoranthene	ND	10	5.88	59	10	6.09	61	3	30-150	30
Benzo(g,h,i)perylene	ND	10	7.7	70	10	6.68	67	5	50-130	30
Chrysene	ND	10	7.25	72	10	6.7	67	8	50-130	30
Dibenzo(a,h)anthracene	ND	10	7.48	75	10	7.11	71	5	40-140	30
Fluoranthene	ND	10	6.78	68	10	6.3	63	7	50-130	30
Fluorene	ND	10	5.91	59	10	5.23	52	12	40-130	30
Indeno(1,2,3-cd)pyrene	ND	10	7.56	76	10	7.15	71	6	30-140	30
Naphthalene	ND	10	5.91	59	10	5.42	54	9	30-130	30
Phenanthrene	ND	10	6.23	62	10	5.89	59	6	40-130	30
Pyrene	ND	10	6.28	63	10	6.11	61	3	40-130	30

SURROGATE PARAMETER	SPIKE AMT (ug/L)	BS RSLT (ug/L)	BS % REC	SPIKE AMT (ug/L)	BSD RSLT (ug/L)	BSD % REC	QC LIMIT (%)
Terphenyl-d14	10	6.8	68	10	6.72	67	50-130

EMAX QUALITY CONTROL DATA
MS/MSD ANALYSIS



CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14137
BATCH NO.: 06C140
METHOD: SW 3520C/8270C SIM

IX: WATER % MOISTURE: NA
DILUTION FACTOR: .94 .94
SAMPLE ID: 0004-123
LAB SAMP ID: C140-06 C140-06M C140-06S
LAB FILE ID: RCZ269 RCZ270 RCZ271
DATE EXTRACTED: 03/17/06 17:00 03/17/06 17:00 03/17/06 17:00 DATE COLLECTED: 03/14/06
DATE ANALYZED: 03/20/06 16:54 03/20/06 17:13 03/20/06 17:32 DATE RECEIVED: 03/15/06
PREP. BATCH: SVC018W SVC018W SVC018W
CALIB. REF: RCZ053 RCZ053 RCZ053

ACCESSION:

PARAMETER	SMPL RSLT (ug/L)	SPIKE AMT (ug/L)	MS RSLT (ug/L)	MS % REC	SPIKE AMT (ug/L)	MSD RSLT (ug/L)	MSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Acenaphthene	ND	9.4	4.98	53	9.4	4.54	48	9	40-130	30
Acenaphthylene	ND	9.4	5.39	57	9.4	4.91	52	9	40-130	30
Anthracene	ND	9.4	5.75	61	9.4	5.44	58	6	50-130	30
Benzo(a)anthracene	ND	9.4	5.78	61	9.4	5.45	58	6	50-130	30
Benzo(a)pyrene	ND	9.4	6.01	64	9.4	5.83	62	3	50-130	30
Benzo(b)fluoranthene	ND	9.4	5.93	63	9.4	6.17	66	4	50-130	30
Benzo(k)fluoranthene	ND	9.4	5.99	64	9.4	4.49	48	28	50-130	30
Benzo(g,h,i)perylene	ND	9.4	5.68	60	9.4	5.47	58	4	50-130	30
Chrysene	ND	9.4	5.45	58	9.4	5.13	55	6	50-130	30
Dibenzo(a,h)anthracene	ND	9.4	6.18	66	9.4	5.91	63	4	40-140	30
Fluoranthene	ND	9.4	5.79	62	9.4	5.69	61	2	50-130	30
Fluorene	ND	9.4	5.33	57	9.4	4.81	51	10	40-130	30
Indeno(1,2,3-cd)pyrene	ND	9.4	5.94	63	9.4	5.68	60	4	30-140	30
Naphthalene	ND	9.4	5.08	54	9.4	4.58	49	10	30-130	30
Phenanthrene	ND	9.4	5.63	60	9.4	5.09	54	10	40-130	30
Pyrene	ND	9.4	5.56	59	9.4	5.54	59	0	40-130	30

SURROGATE PARAMETER	SPIKE AMT (ug/L)	MS RSLT (ug/L)	MS % REC	SPIKE AMT (ug/L)	MSD RSLT (ug/L)	MSD % REC	QC LIMIT (%)
Terphenyl-d14	9.4	6.73	72	9.4	6.82	73	50-130

LABORATORY REPORT FOR

SES-TECH

CAMP PENDLETON, UST SITE 14137

METHOD 3520C/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

SDG#: 06C140

CASE NARRATIVE

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14137
SDG: 06C140

METHOD 3520C/8015B TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Eight (8) water samples were received on 03/15/06 for Total Petroleum Hydrocarbons by Extraction analysis by Method 3520C/8015B in accordance with SW846 3RD Edition.

1. Holding Time

Analytical holding time was met. Extraction was performed on 03/20/06 and completed on 03/21/06.

2. Calibration

Initial calibration was seven points for Diesel. %RSDs were within 20%. Continuing calibrations were carried out at 12-hour intervals and all recoveries were within 85-115%.

3. Method Blank

Method blank was free of contamination at half of the reporting limit.

4. Surrogate Recovery

All recoveries were within QC limits.

5. Lab Control Sample/Lab Control Sample Duplicate

All recoveries were within QC limits.

6. Matrix Spike/Matrix Spike Duplicate

Sample C140-06 was spiked. Recoveries were within QC limits.

7. Sample Analysis

Samples were analyzed according to the prescribed QC procedures. All criteria were met. Sample results were quantitated from C10 to C24 using Diesel (C10-C24) calibration factor.

Samples C140-04, -07 and -08 displayed motor oil-like fuel pattern.

LAB CHRONICLE
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION



Client : SES-TECH
Project : CAMP PENDLETON, UST SITE 14137
SDG NO. : 06C140
Instrument ID : 6CT050

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis Date/Time	WATER		Extraction Date/Time	Sample Data FN	Calibration Data FN	Prep. Batch	Notes
MBLK1W	DSC018WB	1	NA	03/22/0620:04			03/20/0612:00	TC21040A	TC21036A	DSC018W	Method Blank
LCS1W	DSC018WL	1	NA	03/22/0618:40			03/20/0612:00	TC21038A	TC21036A	DSC018W	Lab Control Sample (LCS)
LCD1W	DSC018WC	1	NA	03/22/0619:23			03/20/0612:00	TC21039A	TC21036A	DSC018W	LCS Duplicate
0004-119	C140-02	.94	NA	03/23/0604:27			03/20/0612:00	TC21052A	TC21049A	DSC018W	Field Sample
0004-120	C140-03	.94	NA	03/23/0605:08			03/20/0612:00	TC21053A	TC21049A	DSC018W	Field Sample
0004-121	C140-04	.95	NA	03/23/0605:50			03/20/0612:00	TC21054A	TC21049A	DSC018W	Field Sample
0004-122	C140-05	.94	NA	03/23/0610:43			03/20/0612:00	TC21061A	TC21049A	DSC018W	Field Sample
0004-123	C140-06	.94	NA	03/23/0606:32			03/20/0612:00	TC21055A	TC21049A	DSC018W	Field Sample
0004-124	C140-07	.94	NA	03/23/0608:37			03/20/0612:00	TC21058A	TC21049A	DSC018W	Field Sample
0004-125	C140-08	.94	NA	03/23/0609:19			03/20/0612:00	TC21059A	TC21049A	DSC018W	Field Sample
0004-126	C140-09	.95	NA	03/23/0610:01			03/20/0612:00	TC21060A	TC21049A	DSC018W	Field Sample
0004-123MS	C140-06M	.95	NA	03/23/0607:13			03/20/0612:00	TC21056A	TC21049A	DSC018W	Matrix Spike Sample (MS)
0004-123MSD	C140-06S	.96	NA	03/23/0607:55			03/20/0612:00	TC21057A	TC21049A	DSC018W	MS Duplicate (MSD)

FN - Filename
% Moist - Percent Moisture

000000

SAMPLE RESULTS

METHOD 3520C/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : SES-TECH                      Date Collected: 03/14/06
Project     : CAMP PENDLETON, UST SITE 14137 Date Received: 03/15/06
Vial No.    : 06C140                      Date Extracted: 03/20/06 12:00
Sample ID   : 0004-119                    Date Analyzed: 03/23/06 04:27
Lab Samp ID : C140-02                     Dilution Factor: .94
Lab File ID : TC21052A                    Matrix          : WATER
Ext Btch ID : DSC018W                     % Moisture       : NA
Calib. Ref. : TC21049A                    Instrument ID    : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
DIESEL	ND	.094	.024

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	98	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

METHOD 3520C/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : SES-TECH                      Date Collected: 03/14/06
Project     : CAMP PENDLETON, UST SITE 14137 Date Received: 03/15/06
Batch No.   : 06C140                       Date Extracted: 03/20/06 12:00
Sample ID: 0004-120                       Date Analyzed: 03/23/06 05:08
Lab Samp ID: C140-03                      Dilution Factor: .94
Lab File ID: TC21053A                     Matrix       : WATER
Ext Btch ID: DSC018W                      % Moisture    : NA
Calib. Ref.: TC21049A                     Instrument ID : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
DIESEL	ND	.094	.024

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	98	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

METHOD 3520C/80158
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

=====
Client : SES-TECH Date Collected: 03/14/06
Project : CAMP PENDLETON, UST SITE 14137 Date Received: 03/15/06
Batch No. : 06C140 Date Extracted: 03/20/06 12:00
Sample ID: 0004-121 Date Analyzed: 03/23/06 05:50
Lab Samp ID: C140-04 Dilution Factor: .95
Lab File ID: TC21054A Matrix : WATER
Ext Btch ID: DSC018W % Moisture : NA
Calib. Ref.: TC21049A Instrument ID : GCT050
=====

PARAMETERS	RESULTS	RL	MDL
-----	(mg/L)	(mg/L)	(mg/L)
DIESEL	2.2 ✓	.095	.024

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
-----	-----	-----
HEXACOSANE	108	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

METHOD 3520C/80158
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : SES-TECH                      Date Collected: 03/14/06
Project     : CAMP PENDLETON, UST SITE 14137 Date Received: 03/15/06
Batch No.   : 06C140                       Date Extracted: 03/20/06 12:00
Sample ID   : 0004-122                     Date Analyzed: 03/23/06 10:43
Lab Samp ID : C140-05                       Dilution Factor: .94
Lab File ID : TC21061A                     Matrix          : WATER
Ext Btch ID : DSC018W                      % Moisture       : NA
Calib. Ref. : TC21049A                     Instrument ID    : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
DIESEL	ND	.094	.024

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	90	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

METHOD 3520C/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client       : SES-TECH                      Date Collected: 03/14/06
Project      : CAMP PENDLETON, UST SITE 14137 Date Received: 03/15/06
Batch No.    : 06C140                       Date Extracted: 03/20/06 12:00
Sample ID    : 0004-123                     Date Analyzed: 03/23/06 06:32
Lab Samp ID  : C140-06                      Dilution Factor: .94
Lab File ID  : TC21055A                     Matrix       : WATER
Ext Btch ID  : DSC018W                      % Moisture   : NA
Calib. Ref.  : TC21049A                     Instrument ID : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
DIESEL	ND	.094	.024

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	107	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

METHOD 3520C/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : SES-TECH                      Date Collected: 03/14/06
Project     : CAMP PENDLETON, UST SITE 14137 Date Received: 03/15/06
Batch No.   : 06C140                      Date Extracted: 03/20/06 12:00
Sample ID: 0004-124                      Date Analyzed: 03/23/06 08:37
Lab Samp ID: C140-07                     Dilution Factor: .94
Lab File ID: TC21058A                    Matrix       : WATER
Ext Btch ID: DSC018W                     % Moisture    : NA
Calib. Ref.: TC21049A                     Instrument ID : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
DIESEL	.25	.094	.024

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	107	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

METHOD 3520C/80158
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client       : SES-TECH                      Date Collected: 03/14/06
Project      : CAMP PENDLETON, UST SITE 14137 Date Received: 03/15/06
Batch No.    : 06C140                       Date Extracted: 03/20/06 12:00
Sample ID    : 0004-125                     Date Analyzed: 03/23/06 09:19
Lab Samp ID  : C140-08                     Dilution Factor: .94
Lab File ID  : TC21059A                    Matrix       : WATER
Ext Btch ID  : DSC018W                     % Moisture    : NA
Calib. Ref.  : TC21049A                    Instrument ID : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
DIESEL	.26	.094	.024

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	107	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

METHOD 3520C/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : SES-TECH                      Date Collected: 03/14/06
Project     : CAMP PENDLETON, UST SITE 14137 Date Received: 03/15/06
Batch No.   : 06C140                       Date Extracted: 03/20/06 12:00
Sample ID: 0004-126                       Date Analyzed: 03/23/06 10:01
Lab Samp ID: C140-09                      Dilution Factor: .95
Lab File ID: TC21060A                     Matrix       : WATER
Ext Btch ID: DSC018W                      % Moisture    : NA
Calib. Ref.: TC21049A                     Instrument ID : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
DIESEL	ND	.095	.024

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	107	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

QC SUMMARIES

METHOD 3520C/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

```

=====
Client      : SES-TECH                      Date Collected: NA
Project     : CAMP PENDLETON, UST SITE 14137 Date Received: 03/20/06
Sample No.  : 06C140                       Date Extracted: 03/20/06 12:00
Sample ID   : MBLK1W                       Date Analyzed: 03/22/06 20:04
Lab Samp ID : DSC018WB                     Dilution Factor: 1
Lab File ID : TC21040A                     Matrix          : WATER
Ext Btch ID : DSC018W                      % Moisture       : NA
Calib. Ref. : TC21036A                     Instrument ID    : GCT050
=====
  
```

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
DIESEL	ND	.1	.025

SURROGATE PARAMETERS	% RECOVERY	QC LIMIT
HEXACOSANE	112	65-135

RL : Reporting Limit
Parameter H-C Range
Diesel C10-C24

EMAX QUALITY CONTROL DATA
LCS/LCD ANALYSIS

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14137
BATCH NO.: 06C140
METHOD: METHOD 3520C/8015B

MATRIX: WATER % MOISTURE: NA
DILUTION FACTOR: 1 1
SAMPLE ID: MBLK1W
LAB SAMP ID: DSC018WB DSC018WL DSC018WC
LAB FILE ID: TC21040A TC21038A TC21039A
DATE EXTRACTED: 03/20/0612:00 03/20/0612:00 03/20/0612:00 DATE COLLECTED: NA
DATE ANALYZED: 03/22/0620:04 03/22/0618:40 03/22/0619:23 DATE RECEIVED: 03/20/06
PREP. BATCH: DSC018W DSC018W DSC018W
CALIB. REF: TC21036A TC21036A TC21036A

ACCESSION:

PARAMETER	BLNK RSLT (mg/L)	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Diesel	ND	5	4.61	92	5	4.61	92	0	65-135	30

SURROGATE PARAMETER	SPIKE AMT (mg/L)	BS RSLT (mg/L)	BS % REC	SPIKE AMT (mg/L)	BSD RSLT (mg/L)	BSD % REC	QC LIMIT (%)
Hexacosane	.25	.275	110	.25	.282	113	65-135

EMAX QUALITY CONTROL DATA
MS/MSD ANALYSIS

CLIENT: SES-TECH
PROJECT: CAMP PENDLETON, UST SITE 14137
CH NO.: 06C140
MOD: METHOD 3520C/8015B

MATRIX: WATER % MOISTURE: NA
DILUTION FACTOR: .94 .95 .96
SAMPLE ID: 0004-123
LAB SAMP ID: C140-06 C140-06M C140-06S
LAB FILE ID: TC21055A TC21056A TC21057A
DATE EXTRACTED: 03/20/0612:00 03/20/0612:00 03/20/0612:00 DATE COLLECTED: 03/14/06
DATE ANALYZED: 03/23/0606:32 03/23/0607:13 03/23/0607:55 DATE RECEIVED: 03/15/06
PREP. BATCH: DSC018W DSC018W DSC018W
CALIB. REF: TC21049A TC21049A TC21049A

ACCESSION:

PARAMETER	SMPL RSLT (mg/L)	SPIKE AMT (mg/L)	MS RSLT (mg/L)	MS % REC	SPIKE AMT (mg/L)	MSD RSLT (mg/L)	MSD % REC	RPD (%)	QC LIMIT (%)	MAX RPD (%)
Diesel	ND	4.75	4.44	93	4.8	4.16	87	7	65-135	30

SURROGATE PARAMETER	SPIKE AMT (mg/L)	MS RSLT (mg/L)	MS % REC	SPIKE AMT (mg/L)	MSD RSLT (mg/L)	MSD % REC	QC LIMIT (%)
Hexacosane	.238	.266	112	.24	.256	107	65-135

